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LAW, POLITICS AND RELIGION

By GEORGE BRONSON REA

AMERICA'S TWENTY-ONE DEMANDS

By JAMES TRAPIER LOWE

Vol. XXXII APRIL, 1936 No. 4

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Law, Politics and Religion

How Roosevelt May Be Defeated

By GEORGE BRONSON REA

Writing in *The Catholic World*, the Rev. James Gillis calls this year's address of the President to Congress "an amazing document." "To begin with," he says, "although by law and tradition the President's subject was 'the state of the Union,' careless of custom and propriety he launched forth with an invidious comparison between ourselves and the 'rest of the world.' After taking the President to task on a number of things which have no direct bearing on the Far East, he comes to the crux of his denunciation:

> "To take up for a moment another matter, not so important as our attitude to Europe, but none the less of considerable interest to some American citizens. What of the Mexicans? Will Mr. Roosevelt fly in the face of facts and say that in Mexico thought is free, and suffrage free, and religion free? There is abundance of incontrovertible evidence of injustice, cruelty, blood-shedding and religious persecution of Catholics in Mexico. Is Mexico, none the less, a 'good neighbor?'
>
> "I do not maintain that the President was obliged to make reference to conditions in Mexico while speaking on the state of our Union (though I may perhaps remark parenthetically that the state of our Union will sooner or later be affected by conditions in Mexico) but I do think that since Mr. Roosevelt took it upon himself to scold the governments of Germany and Italy as intolerant and autocratic he might have spared a little indignation for the rulers of Mexico, and since he sympathized with the German and Italian peoples, he might have expressed some pity for the Mexicans. If Italy and Germany, why not Mexico? Is there to be no answer? Will he fall back upon the convenient phrase, 'No Intervention?' Nobody, as far as I know, has asked for or desires intervention. Not intervention, but why not a little expostulation? If expostulation is too much, what about a polite statement that the people of the United States do not like to see a neighbor nation dipping its hands in the blood of those who die for conscience' sake?"

The Reverend Father apparently is not well informed as to the influences which have, in the past, determined the policies of his own Government. He should read Henry Morganthau's book, "All in a Lifetime," "Colonel House's Memoirs" and then turn to a passage in Tumulty's book, "Wilson as I knew Him," for elucidation of the principles which have guided our diplomacy in countries indicated as special fields for our Evangelical activities. In Morganthau's and Colonel House's confessions, he will learn that our chief interests in China are largely missionary, calling for a Christian and preferably a man of the Evangelical type to represent the Nation as Minister at Peking, where his principal duties are to protect our uplift activities and investments. He will learn from Tumulty the reason Wilson did not declare war on Turkey as one of the Central Powers was because of his solicitude for our important educational and philanthropic institutions in that country, whose properties and plants would be confiscated by a declaration of war.

Two Different Things

Christianity in China and Christianity in Mexico are two quite different things. We are preparing, so we are told, to build a great navy to uphold the Open Door to China, that is, to defend our right to remain in business as a charitable institution and carry forward the good work we have already started. The fact that "the state of the Union will sooner or later be affected by conditions in Mexico," is of minor consequence compared with our duty towards China and the maintenance of a policy, which, since our abandonment of the Monroe Doctrine and the Freedom of the Seas, becomes the cardinal feature of our diplomacy. We will never again intervene in the affairs of a neighboring state, even should conditions there seriously menace our own institutions and security. What we did in the past to coerce Mexico is now forgotten. We have absolved ourselves of past misdeeds and stand forth as the self-anointed judge of world morality. We will never again impose on Mexico. To do that, would set a bad example and justify what Japan has done in self-defense in Manchoukuo and North China.

Americans are peculiar about these things. Whatever we may have done in our own sphere for the protection of our own interests can never be invoked as a precedent by other nations when confronting similar emergencies. One very distinguished American Secretary of State gave his name to a universal pact to outlaw war as an instrument of national policy. But this abhorrence of war between peoples of our own race did not extend to the most pitiless slaughter of modern times that in two decades has accounted for the deaths of thirty or more million people. In fact, it can be argued that the universal Peace Pacts actually legalized this carnage in the name of the sacred *status quo* and the still more sacrosanct Balance of Power, by conceding to one Asiatic satrap all the time necessary to impose his rule by the sword over one quarter of the world's population. Then, when one group of his victims seized the first opportunity that presented to break away from his despotic rule and declare its independence, another equally distinguished American Secretary of State without awaiting the results of an investigation into the justice of their cause, precipitately promulgated and gave his name to a new law of nations refusing to recognize any state that might come into existence by violating the law laid down by his predecessor. Principles of liberty and justice which have guided our diplomacy in every other case where oppressed peoples have thrown off their yokes of servitude seemingly no longer apply.

Regarding Judgments

International law as interpreted by the treaties can always be given various meanings under the overwhelming pressure of national interest. Everything depends upon the views of those making the interpretation. "The process of judging," says Jerome Frank in his challenging book "Laws and the Modern World," "so the psychologists will tell us, seldom begins with a premise from which a conclusion is subsequently worked out. Judging begins the other way around—with a conclusion more or less vaguely formed: and a man ordinarily starts with such a conclusion and afterwards tries to find premises which will substantiate it."

And that is just what happened in the Far East. The judges understood that principles, precedents, history, justice and right were on the side of the people of Manchoukuo, that their case was fully justified by every canon of international law as then applicable. A new law had to be hastily devised to deny to these people their inalienable right to break away from oppression and set up their own government. So an American Secretary of State, a brilliant international lawyer, found the answer in a new Non-Recognition Doctrine based on the Peace Pacts. With this new principle adopted by Geneva during the progress of the investigation, the League Commission formed its conclusions and worked backwards to reach premises seeming to indicate those conclusions. Right and justice were subordinated to a new impromptu law devised to deny that right, a law that will rise to plague us every time oppressed peoples in any part of the world resort to force or take advantage of any outside intervention to free themselves.

Because we of the West cannot distinguish the difference between these tribes of a common race, who look, act and dress alike, but speak different languages, we say to them that they must stick together and form one nation. Just as though all the different races of Europe, Africa or South America should be grouped together and governed as one nation. The law which, in the past, has applied to the dissolution of all other Empires into their component parts, can never be extended to the tribes of Cathay, which for many centuries had been subjugated and held together under a viceregal system recognizing the complete independence of the Eighteen conquered entities. The Homelands of the conquerors were never included in that system. They remained separate and distinct, a reservoir from which to draw fresh troops to hold their conquest or as safe refuge in the event of defeat and retreat.

All this, however, the law-makers of the West reject as having no bearing on treaties entered into in defiance of these facts. We devised our own laws and now say in effect that these peoples of a common race must solve their problems in their own way, that we cannot interfere in their tribal quarrels and, in pursuit of this policy and for our own convenience, we will recognize the faction or warlord temporarily in control of Peking or Nanking, as the case may be, and sell him all the arms, munitions and aeroplanes he can pay for while consolidating his rule over all the others. And then, when the others protest against this unwarranted intervention and resist the foreign-recognized faction, we adhere to our preconceived idea of their proper status and inform them that it is their own affair. Just like telling the lamb in the wolf's mouth to appeal to the hungry wolf for justice and mercy.

Causes and Consequences

As a result of our policy of "non-interference," we are now told that "the tide of nationalism is sweeping over China." In the same manner and by the same methods that two million Communists have terrorized 170,000,000 Slavs into submission, three hundred thousand so-called Chinese Nationalists are consolidating their rule over 500,000,000 of their less fortunate, unrecognized and poorly armed brothers. Yes, a "National Republic of China" will arise. It will take its place in the Society of Nations and a seat in the Council of the League. It will rest upon armies of occupation holding the provinces in subjection; another formidable militaristic state called into being by foreign intervention, without any consideration for the rights of the people concerned, a "republic" resting solely upon force, not the consent of the governed.

And it is well to remember that the so-called Nationalist Movement in China was merely the screen behind which the Red Terror was operating to bring all China under its sway. Without Moscow's help, Borodin's organizing genius and Blucher's generalship, Chiang Kai-shek and his Nationalist armies would never have crossed the borders of Kwangtung. That the American people and their Government were hypnotized in 1926-27 into sympathizing with the Nationalist cause was due almost entirely to the tremendous pressure brought to bear on Washington by the missionary groups in China who eagerly swallowed the glittering bait held out before them by the Red leaders that should they triumph, they would proclaim religious liberty and every other aim the uplifters had been advocating for the regeneration of the country. The Red leaders captured the imagination and held the sympathy of Americans by playing on the hopes of our missionaries and educators, who, in turn, gave their full support to the Nationalist movement.

President Coolidge and the State Department were deluged with appeals and demands to recognize the Nationalists and do nothing that might arouse their animosity or hostility. At the precise time when the lives and properties of Americans in Shanghai were in grave danger, the missionary and uplift element bombarded Washington with demands to withdraw our warships and troops from China and surrender our interests to the safe keeping of the conquering Nationalist patriots marching northwards under the Banner of the Kuomintang Sun.

We speak with exact knowledge in regard to the tremendous pressure brought to bear by the uplift group on Washington at this period of grave peril to American citizens. The members of the American Chamber of Commerce in Shanghai, alarmed for the safety of their loved ones, unanimously elected the Publisher of *The Far Eastern Review* (then in the United States recuperating from a severe illness), to represent their interests in Washington and do everything possible to keep the warships and troops on the job as the only guarantee that their lives and properties would be protected. After pleading their cause before the Convention of the National Foreign Trade Council at Detroit, he was called to Washington to place their case before President Coolidge.

For nearly an hour he explained the exact situation and retains a very vivid recollection of the President's sympathetic understanding and what he had to say. The warships and troops were not withdrawn. The policy of the Administration was clearly set forth when Consul Davis at Nanking was promoted and the officer in command of our gunboats commended for his prompt defense of American lives when the Chinese Reds ran amok and started their massacre. If the Publisher of this magazine is now somewhat emphatic about the intervention of religion in our Far Eastern policies, it is because he has fairly accurate information as to how our Evangelical Missionary Boards swung the club over the State Department at a time when, for the advancement of their own special interests, they would have deprived the commercial element of that protection our Government was in duty bound to extend.

We Decline to Act

Although the Administration discharged faithfully its obligations for the protection of American lives and properties at Shanghai during the crisis of 1927, it declined to go any further. When, in conformity with the provisions of the Nine Power Treaty calling for full and frank communication between the interested Powers, Great Britain and France, having vast interests in the Yangtze Valley, requested the United States to join in a show of force in support of demands upon the newly created Nationalist Government of the Republic of China, Washington politely but firmly declined to co-operate. Had we then linked our forces with these other Powers and assisted Nanking in crushing the Red movement at its birth, we would not now be recriminating Great Britain for refusing to support us at Geneva against Japan when our own interests seemed paramount.

A strong case could be made out to show that as a direct result of the intervention of religion in our diplomacy of 1927, we paid the price in 1932 at Geneva when Sir John Simon stood out firmly against any open condemnation of Japan as the aggressor and the application of sanctions which Great Britain almost alone would have been called upon to enforce. Nations and their Governments have long memories. In all fairness we could not expect Great Britain and France to grow unduly excited over Secretary Stimson's denunciations of Japan for breaking the Nine Power Treaty and rushing to our assistance, when we declined in 1927 to co-operate with these same Powers to eliminate the causes which led to Japan's resort to self-defense in 1931. And by the same reasoning, Japan would have been foolish indeed after such a precedent to have waited for America's approval to her right to resort to measures of self-defense when we had, in effect, refused it to Great Britain and France in 1927.

Naturally, the smaller Nations of the League accepted, endorsed and made the Stimson Non-Recognition Doctrine their own, but the more experienced and practical statesmen of Britain and France, remembering our past amazing contortions on the flying trapeze of international politics, were not unduly thrilled over this new stunt.

They realized that Mr. Stimson could not commit his Government to any program that implied the application of sanctions or force and that, in a showdown, the United States Senate would have the last say. Furthermore, due to America's naval unpreparedness and inability to co-operate effectively in any joint pressure upon Japan, added to the fact that the main British battle-fleet was tied to its Home base, any open rupture with Japan would have invited humiliation.

When, in addition, they recalled how the United States had rejected the Versailles Treaty, the Covenant and the Tripartite Treaty, impairing the usefulness of the League at its birth, and how we had declined to co-operate with them in 1927 when their vast interests were imperilled in China, it required considerable assurance to ask them to rally around in 1932 when our own special interests were seemingly placed in jeopardy. The Powers directing the League are very old, very experienced and very wise in this game.

If these lessons be taken to heart the sooner we abandon our one-sided policies and doctrines, the better it will be for our hopes of permanent peace in the Pacific and that trade expansion based upon friendly co-operation with the one Power in Asia competent to assume the obligation of stabilizing conditions in this part of the world. And that hope of peace and good understanding must be based squarely on the renunciation of a doctrine which refuses recognition to a state which set itself up as the only guarantee that peace in Eastern Asia will be maintained.

What Is a Republic ?

Father Gillis has much to learn about the difference between a republic such as the Fathers created and our present day conception of another republic where our basic political principles and creed have become subordinated to ideals and hopes concealed behind the alluring front of a trade policy. To understand just how far we have strayed in imposing our peculiar ideas in this part of the world, Father Gillis might, with profit, study the other side of our relations with Mexico since it set up in business for itself.

In *Diplomatic Protection of Americans in Mexico* by Frederick Sherwood Dunn, he will find sufficient evidence from the official records to convince him that for over half a century the diplomacy of nearly every American Minister to Mexico was concentrated on finding ways to acquire further territory from that country by bringing pressure upon its Government for the settlement of cooked-up claims. But the methods we applied to despoil Catholic Mexico cannot be employed by Japan to impair the sacrosanct territorial and political sovereignty of "Pagan China."

The fact that Japan has twice staked her existence in war to defend her independence, that she was coerced by other Powers to surrender the lawful fruits of her victory over China, swindled by the suppression of the existence of a secret treaty out of a just indemnity in her war with Russia, compelled under severe diplomatic pressure to forego part of her gains for participating in the World War and ousting the Germans from Shantung, and again confronted with the necessity of being ever on her guard to defend herself against a menace brought closer to her shores by the complete break-down of government in China, apparently does not justify her in our eyes in resorting to measures of defense legalized in every other part of the world. We make our own law to justify our exclusive right to intervene in Mexico where our interests and security are paramount and then devise other laws and treaties which deny that same right to Japan when her vital strategic and economic security is placed in jeopardy. One law for Mexico, another for China. There, in the past, our chief concern and interest has been the protection of the territorial and political integrity of a country for the advancement of our cultural, religious and uplift activities.

Conditions may have changed in the last few years. Certainly, our present Ambassador to China is not of the missionary or Evangelical type. In fact, he is rather a hard-boiled practical diplomat, perhaps the best who ever filled the post, the exception that proves the rule. American interests are safe in his hands if Washington backs him up. However, the day will arrive when, let us hope, he will be promoted, and a new selection will have to be made.

The Administration in power may have revised its ideas about our messianic rôle in the Far East. As to whether or not there has been any modification in our basic attitude towards China as expounded by Wilson and Bryan, Father Gillis or his superiors in the Church can ascertain by a confidential talk with "Jim" Farley or any of their co-religionists enjoying the confidence of the President.

A Significant Event

Two years ago, the Pope recognized Manchoukuo and appointed an Apostolic Delegate to reside in Hsinking. Father Gillis might inform himself through discreet inquiries in Washington just why this news was soft-pedalled and even slightingly referred in the press and treated as a joke. He might ask himself what would have been the natural reaction of all good Catholics in the United States to this announcement and, whether or not their influence might have been brought to bear on the Administration to depart from the Non-Recognition Doctrine laid down by its predecessors in office ? He might have learned that there existed a bond of deep friendship and sympathy between certain Orders of his Church and the Manchu Dynasty, reaching back for over three centuries. He might with propriety submit to the State Department as an official document that *Short Sketch of the History of the Catholic Church in China from the Earliest Records to Our Own Days*, compiled by Father Paschal M. D'Elia, S.J., of the University of Rome, which shows that from the Second Century the Catholic Church has been active in spreading the Faith in Cathay.

This little sketch will help to understand something of the close bond that linked Rome with the old Rulers of China. Four years after the Manchus set up their dynasty in Peking (1648) four members of the Emperor's family were baptized into the Faith and two years later (1650) the first Catholic Church was built in Peking with a large contribution from the Emperor. When the first Protestant missionaries arrived in China in 1807, the number of Chinese Catholics was well over 200,000. He might then ask himself why a great Christian movement that now counts 16,000 on its Missionary Staff and over 2,600,000 communicants has been relegated to a second place ; why the Evangelical missions with a staff of 7,600 (at the peak) and communicants numbering less than 500,000, have so engrossed and monopolized the attention of our Government that only one of their type and belief could be appointed Minister to China ?

The writer is not a Catholic, but as a fair-minded American, believes that they are entitled to as much consideration under our form of Government and liberty of worship as any Protestant Evangelical Sect, especially in a field which they discovered and labored in centuries before the Reformation and where they have confined their activities to the only task which justifies their being there. If our main interests in China are missionary and the American Minister must be a man of the Evangelical type, as demanded by Wilson and Bryan, then the evidence seems irrefutable that we have been discriminating against a Church whose long activities and success entitle it to preferred treatment, or, at least, equal influence in moulding our diplomacy and policies towards that country.

It is well to stop here and ponder over a few facts. It may be true that in certain countries, the Catholic Church has unduly interfered in questions of state and government. Be that as it may. But the evidence is also irrefutable that the same practices are indulged in by the Evangelical Sects who have subordinated their rightful mission of spreading the Gospel to other uplift, educational, medical and philanthropic activities, which have nothing to do with religion and which call for constantly increasing contributions and endowments that surpass in volume the annual profits from our trade with China. And it can also be demonstrated that these Evangelical educational activities lie at the root of all China's political unrest and, that because of the important capital investments in buildings and plant, their protection has become the first concern of the American Government in China.

Just a Matter of Fact

This is not intended as a criticism, but as a simple statement of fact from which the reader can draw his own conclusions. It is restated in this article merely again to emphasize truths that must be squarely faced and taken into consideration in any thoughtful study of problems which may, if left unsolved and permitted to drift, land the Nation in a war to uphold a doctrine or policy, which analysed, discloses that we may be called upon to fight for our right to contribute the profits from our trade to the religious and cultural regeneration of 500,000,000 people taxed to death by their war-lord rulers to maintain the greatest armies the modern world has seen.

From whatever angle, religious or political, this picture is viewed, these facts stare us in the face and demand attention at this moment when those directing our destinies are giving careful study to our future naval program. Whether we are willing to admit it or not, religious and cultural influences enter largely into the shaping of our future Far Eastern policies. Experience teaches us that as our commercial investments and trade profits increase in China, the demands on our philanthropists for the endowment of cultural plants increase in exact proportion. Like a snowball rolling down hill it gathers bulk with its own momentum. Even now in the midst of a depression with 12,000,000 people out of work in the United States, a campaign is under way in the Middle West to raise another half-million dollars for the further endowment of a school attached to one of our educational plants in China. And these whirlwind fund-raising campaigns for uplift work in China are monopolized exclusively by the Protestant Evangelical Sects, never the Catholics. The latter establish and carry on their own institutions in a less spectacular way and the world hears nothing about it.

All Democrats are not Catholics, but in their vast majority, all Catholics are Democrats and there are 20,000,000 of them in the United States, more than enough to swing a presidential election. Should they inject their religion into the political campaign, not all the billions at the command of " Jim " Farley could save his Party from defeat. And from all indications, the Catholics are far from pleased with the Administration for its silence as to what is transpiring in Mexico while holding tenaciously to policies devised for the special advancement of other religious interests in China.

When it can be proven by unimpeachable Democratic testimony and an analysis of our trade returns, that our interests in China, as President Wilson so frankly stated to the elder Mr. Morganthau, are largely Evangelical and by implication, warned him that no Jew, Unitarian or Catholic, could be appointed Minister to that country, and furthermore, that the Nation has been assiduously educated over the years to believe that it may have to go to war to enforce the Open Door Doctrine, which means our right to remain in business as an eleemosynary institution, giving away the profits of our trade to maintain our uplift activities, there is something radically wrong with our policies and outlook on these matters.

Is This Discrimination ?

In view of the Administration's silence on what the Church believes to be a religious persecution in Mexico, and recalling how the American Government severed diplomatic relations with Russia over outrages on the Jews, how the whole Nation has been aroused over Hitler's treatment of the same people and the fact that our policies in China for the protection of which we are building a great navy, are based largely on our Evangelical religious interests in that country, the Catholics can make out a case of discrimination that the people of the United States will never tolerate or condone.

Should some gifted Catholic orator, and we have many of them, stand up on the floor of the House or Senate and invite public attention to these inconsistencies in our diplomacy, it would inject a note in the presidential campaign that would prove highly embarrassing to the Administration. If the Democratic leaders are as politically wise as they are credited with being, they will bring the necessary pressure to bear on the proper quarters for the revision of policies which seem to discriminate against the Catholics and take religion out of our diplomacy.

For, unless all signs fail, somebody is going to be placed between the Devil and the deep, blue sea before this campaign is over. Should religion enter into it, should the farmers of the Solid South grasp the truth that the Non-Recognition Doctrine laid down by a Republican statesman is losing their most profitable cotton market, there is liable to be a sudden revision of American Far Eastern policies before this year is out.

No matter how strong their political faith and loyalty to Party, no people will consent meekly to sacrificing their present profitable markets and future prosperity for the sake of a policy based on the very slender hope of trade rewards that can be garnered only through the investment of billions of dollars to create the industries and develop the resources on which that trade can be established, and then appropriate further billions to build the most powerful navy in the world to protect it. Once these basic truths are grasped by the cotton growers of the Southland, they will never consent to sacrificing the chief market for their staple crop in order to establish outlets for the manufactured products of another section of the country.

If the Democratic Party is to adhere to a doctrine promulgated by a Republican Secretary of State that sooner or later will bring ruin to the states which form the stronghold of its political faith, it deserves the defeat that will surely come to it. The scrapping of that doctrine becomes imperative if the Democratic Party is to hold its power. The betting on Roosevelt, we are told, is now about fifty-fifty, an even break. Should the Catholics desert the Party, should the Solid South wake up to what all this Far Eastern Evangelical diplomatic tom-foolery means to their prosperity, F.D.R.'s chances of re-election would be reduced to a hundred to one shot.

* * *

Regarding Mexico

There is evidently another side to the case so impressively argued by Father Gillis that perhaps explains why President Roosevelt very prudently refrained from making any statement that might be construed as an unwarrantable intrusion in the affairs of our next door neighbor. The well-informed Mexican Minister to Japan, General Francisco Aguilar, contends that there is no persecution of Catholics in Mexico on purely religious grounds. The attitude of his Government towards the Church, he avers, arises solely from the interference of its high dignitaries in affairs of state and the meddling of parish priests in local government and, because of the land reform program, it has been difficult to dislodge the various religious Orders from their somewhat privileged position in the exploitation of the people through their ownership of vast tracts of cultivable lands, which at one time embraced over fifty per cent of the total.

He points out that conditions in Mexico have been deliberately misrepresented in the United States and that the Mexican Government, engrossed with its own affairs, has never engaged in a publicity campaign to defend itself or answer its detractors. Experience teaches it that Mexico can never get a fair hearing in the press of the United States when powerful selfish interests set out to create an anti-Mexican opinion in that country. He furthermore states that as for conditions in Mexico affecting the state of the American Union, this also is pure propaganda circulated by those who profess to see in the Government's constitutional program for agrarian reform, a covert attempt to implant Communism. He points out that the building up of huge landed estates in Mexico had practically reduced the people to a state of peonage, little removed from actual slavery, giving rise to discontent, unrest and constant revolution in order to redress their wrongs and better their condition. In order to eliminate these recurring periods of bitter internecine strife, so that a really stable representative Government could function, and Mexico might take her real place in the system of American Republics, it became imperative to alleviate the suffering of the people by a new system of land tenure and distribution. As the Catholic Church in its many ramifications is still a large land-owner, deriving huge revenues which are annually remitted to Rome, constituting a heavy drain on the wealth and economy of the country, it very naturally opposes the new Constitutional program for agrarian reform and the relief of the Mexican people. That is all there is to anti-Catholicism and why so much has been heard about the rapid spread of Communism in Mexico.

There is no Communism as such in Mexico, a fact clearly set forth by American Ambassador Daniels in a speech at the San Diego Fair. General Aguilar invites attention to a recent official statement by General Eduardo Hay, Mexico's Secretary of Foreign Relations. When asked : " Will the Government of General Cardenas allow the establishment in Mexico of the Communist headquarters which has been driven out of or deported from Uruguay and intends to settle in Mexico ? " he answered :

" For reasons of public health, national security and others of a constitutional order, no undesirable elements will be allowed to enter our country, among them, no persons belonging to any groups or sects, such as militant Communists, that attack the institutions of our Republic."

America's Twenty-One Demands

By *JAMES TRAPIER LOWE, Ph.D., Carnegie Fellow in International Law*

Editorial Foreword: The suggested analogy between the American Demands on Cuba in 1900 and Japan's Demands on China in 1915, as presented by Mr. Lowe, overlooks an essential point. As the inside story of the American Demands and ultimatum on Cuba remains a closely guarded secret of the War Department, so the negotiations leading up to China's acceptance of a portion of Japan's Demands are shrouded in deep mystery.

When the negotiations in Peking had reached a stage where it appeared as though they would end in dead-lock, President Yuan Shih-kai sent a personal representative to communicate confidentially to the Japanese Minister that acceptance of the Demands and signing of the treaty would be facilitated if Japan would present an ultimatum. This, he said, would assure immediate acceptance and save his "face." The trusting Japanese walked right into the trap. The Chinese published the ultimatum to the world and swore by all the Gods of Cathay that they had been coerced. Then, when the treaty was signed and ratified, they proclaimed that they would never recognize it. Ignoring all established rules of international law that duress does not render a treaty voidable, they insisted to the contrary and refused to recognize its validity.

Practically every argument in denunciation of what, at the time, appeared to be an uncalled-for and high-handed aggression on China, was drawn up by the Editor of this magazine who directed China's publicity from Peking, or by its Publisher, who was sent on a special mission to the United States to lay the facts unofficially before the American authorities. Because of the secrecy, allegedly imposed by the Japanese, even the Chinese Ministers abroad were not informed of the full extent of the Demands.

It was due, in small part perhaps, to my talks and activities at that period, that the American State Department instead of protesting, compromised by placing its position on record in the Identic Notes of May 11, 1915, directed to China and Japan, informing them that the American Government "could not recognize any agreement or undertaking . . . . . impairing the treaty rights of the United States and its citizens in China, the political or territorial integrity of the Republic in China, or the international policy relative to China, commonly known as the 'Open Door Policy.'"

If I have modified my views on the Twenty-One Demands since 1916, to the bewilderment of many who now accuse me of inconsistency, the following facts will help to understand why I did so. From the days of Tampa and Santiago, I had been honored with the friendship of Theodore Roosevelt. One day, early in 1916, I called on him at his office in West 42nd Street in New York (when he was editing *The New Outlook*) to discuss Far Eastern questions. I had written a series of twelve articles entitled "Japan's Place in the Sun," which were published in nearly 200 American newspapers. When I had explained my views, he said: "Rea, I am disappointed in you. You have prostituted your intelligence and your profession. You have done a great wrong to a great people. I am not in sympathy with your views." And then in his characteristic, straightforward manner he read me a lecture on my duties as an American, the worst "dressing down" I ever received. I departed from his presence a much chastened newspaperman.

On returning to China later on in 1916, I reported very fully on my activities to my old friend, Dr. Sun Yat-sen. When I had finished talking, he said:

> *Pay no attention to those Demands. Yuan Shih-kai made a fool out of you. He drew them up himself. They were the price he was willing to pay Japan for recognizing him as Emperor. He deliberately invited the ultimatum to save his face with his own people. He was a traitor to the Republic.*

Dr. Sun made practically the same statement to other reputable journalists, amongst them, Mr. George E. Sokolsky. It has been difficult to verify the first part of Dr. Sun's charges that Yuan was the author of the Demands. This much, however, can be said.

A close friendship existed between Yuan and Marquis Okuma. Stories were in circulation that Yuan had financed Okuma's campaign in 1914 which elevated him to power after sixteen years of political obscurity. The Presidential archives at Peking reveal that large sums disbursed by Yuan out of the proceeds of the Reorganization Loan of 1913 went to Japan. Okuma is on record as having solemnly affirmed that "as long as I am Premier of Japan, there will be no aggression on China." All of which lends color to Dr. Sun's emphatic statement that Yuan drafted the Demands himself as the price he was willing to pay Japan for recognizing him as Emperor. There is a page of secret history here that may never be revealed. Obviously, neither China or Japan would be anxious to have such truths established. My intimate relationship with Dr. Sun Yat-sen and personal knowledge of his high conception of honor and adherence to the truth, convinced me that he was in possession of inside facts which justified him in making these charges. That Yuan was a "traitor to the Republic" he had sworn to uphold is indisputable.

As Henry Ford Puts It

But if the above charges are difficult to prove, it is different with Dr. Sun's statement concerning the ultimatum. Marquis Okuma, Premier of Japan in 1915, and Viscount Kato, his Foreign Minister, before their deaths, certified to the truth of this statement. Junior attachés in the Japanese Legation in Peking in 1915, have confirmed the statement, even to naming the high Chinese official of the Waichiaopu, who carried Yuan's personal message to Minister Hioki. Until the inside story of the events of 1915 is revealed, this commentator inclines to the belief that Dr. Sun Yat-sen spoke the truth. No Chinese will now acknowledge the truth of any incident or facts which might change the verdict against Japan. No Japanese official concerned in the events of 1915 would testify to facts which place his colleagues in such an unenviable position. "History," as Henry Ford sapiently remarked, "is the bunk."

The Twenty-One Demands will stand as a black mark against Japan. Because she would never officially admit how she had been duped into dispatching the ultimatum, Japan has remained silent, content with what she gained in Manchuria, which, after all, was her real objective. Had Washington, by its Note of May 11, 1915, not encouraged the Chinese to believe that it would never recognize the 1915 Treaty, the incident would have terminated with its ratification. China's insistence, however, that the treaty was extracted under duress and therefore invalid, followed in 1923 by Peking's demand upon Japan to evacuate Liaotung, and Nanking's subsequent refusal to negotiate a new treaty of commerce and amity until its sovereignty was restored over the Leased Territory and Japanese troops withdrawn from Manchuria, kept the issue alive and forced the inevitable showdown.

China overlooked that if the 1915 Treaty was void, Japan's right in Manchuria would then be defined by the Treaty of Portsmouth. In view of the official revelation by China at Washington in 1921 of the text of the Secret Treaty of Alliance between China and Russia of 1896, *aimed at Japan*, and the fact that its existence was unknown when the Portsmouth Treaty was negotiated, made China liable for any reasonable indemnity in cash or territory that Japan might demand, should the case be reopened.

I have reason to believe from what Baron Shidehara told me several years ago that should China persist *in opening the grave*, that is, by contesting the validity of the 1915 Treaty, Japan would have no option but to "go back to Portsmouth" and take her stand on the Secret Li-Lobanoff Treaty of Alliance, which, on its face, revealed hostility and aggression against Japan. Baron Shidehara's diplomacy has been subjected to much unfair criticism since the showdown in 1931, but no post-war diplomat labored harder for peace, for conciliation and good understanding, no statesman of Europe or America gave more whole-hearted loyalty to the League or endeavored so faithfully to live up to the principles of the Pact of Paris, than this leader of Japanese Liberalism. He was, without question, the greatest Liberal of the decade and, had he been permitted to carry through his policies to their logical end, there is no doubt that he would have presented a case that would have won for Japan not only world sympathy and support but full recognition of Japan's rights in Manchuria without breaking any of the rules laid down by Geneva and Washington. The Chinese, however, would not have it that way. They forced incident after incident, until the Japanese Army was compelled to act in self-defense. Then, instead of negotiating direct with Japan, the Chinese threw their case into the League as the only way of escaping a just verdict in favor of Japan on the legal merits of the case.

When Japan Faced a Problem

The Japanese were anxious to settle this question in direct negotiation with China, but there was no responsible authority in that country they could deal with. I recall a talk with my old friend, the late Junnosuke Inouye, Minister of Finance in the Wakatsuki Cabinet, just after the Mukden Incident. He asked me to help him find a solution. "Who can we negotiate with? We cannot negotiate with Chang Hsueh-liang. We cannot permit him to return to Mukden. The people will 'bump him off' if he shows his face in his old capital. Chiang Kai-shek has no power outside of Nanking. We could settle this promptly if we could find someone in China with the power to commit his Government. What can we do?" And to his question I could find no answer. Had there been a responsible Government in China competent to speak for the whole country there would have been no necessity of bringing this purely local incident before a Court which has no elasticity in its judgments and is compelled by the Covenant to bring in a verdict which, to uphold, leads to the application of sanctions and war.

The last paragraph of the little book on "The Evolution of International Public Law in Europe Since Grotius," by Walter Simons, Former Chief Justice of the Supreme Federal Court of Germany, might have been written to cover this case. He says:

> "To have renounced war as a means of national policy does not mean bringing all quarrels before the Court. In private life and in the life of states the best member of society and the most agreeable is not he who renounces force by suing his neighbor before the court, but he who even renounces a lawsuit in order to make friends with his neighbor. And the best statesman, in my opinion, is the man who needs neither generals nor admirals nor judges nor arbitrators to secure, in a difference with another state, the interests of his country."

In these words, Justice Simons faithfully portrayed the character of the men who were, and still are, directing the diplomacy of Japan. At any time they could have presented their case to the League and been sustained. But they preferred to renounce a lawsuit in the hope of winning the friendship of China through conciliation and a private settlement of their dispute. This China would not consent to for reasons above explained.

Time alone will establish the truth and change the verdict of the League against Japan. Only in the years to come, when the events of the past two decades can be correlated and viewed in proper perspective by unbiased historians, will Japan be conceded justice. Only then will the almost superhuman efforts of Baron Shidehara to conciliate China and preserve the peace be recognized and his place in history assured. For, slowly, very slowly, the light of truth is piercing the clouds of propaganda.

It is now admitted by impartial observers that no prearranged program of aggression existed, that the Tanaka Memorial was a fake, that the Mukden Incident of September, 1931, which changed the future of Manchuria, came as a logical sequence to a long list of outrages, the last straw which broke the long-suffering patience and forbearance of the Japanese Army and forced it to act. There is no similarity between the American demands on Cuba and the Japanese demands on China, except in so far as a case can be made out on the published and accepted versions of the negotiations which obviously are incomplete, misleading and, in my opinion, wholly unfair to Japan. From the records available, Mr. Lowe has contributed a highly interesting and instructive parallel. Mr. Lowe's article follows.—GEORGE BRONSON REA.

* * *

I.—We cannot discuss any aspects of 20th century imperialism without cognizance of the path Japan has cut out for herself on the Continent of Asia, and all the potential dangers to the white man's civilization that such a course indicates. Indeed, according to the studied opinions of one of the most influential men in the United States Government, a man second only to the President and Secretary of State in diplomatic importance, Senator Key Pittman (Chairman of the Senate Foreign Relations Committee), we are not only forced to take cognizance of Japanese imperialism, we must prepare to fight Japan:—

> "The present militarist government of Japan," he writes, "plans for conquest of the entire world. . . . I supported the League of Nations sincerely, but it has turned out a terrible failure, particularly in dealing with Japan. The Japanese have seized every opportunity when the Powers were not otherwise tied up, to add territory by conquest. They are banking on England's entanglements in Europe and the pacifist sentiment in the United States to keep these two countries from acting until it is too late. I am sick and tired of pussy-footing with Japan—especially since the statement of its delegate at the London Conference that Japan must have a navy equal to ours because of their fear of war in the Pacific. There are only two things Japan is afraid of, and those are the navies of Great Britain and the United States. If it should happen that these navies should find it necessary to manœuvre in the Pacific near Japan, at about the same time, Japan would listen to reason without a shot being fired, or a life being lost."

Senator Pittman's remarks are a direct, vigorous and utterly sincere expression of the fears of millions of Americans that the present Government of Japan is *militarist*;—that it is thereby a threat to world peace;—that our best interests would be served by combining with Great Britain to stamp out this *menace* to friendly international relations;—and that we could thereby guarantee by force the *territorial integrity of China* and our traditional Far Eastern policy of the *open door*.

Senator Pittman's condemnation of Japan's waiting for a propitious moment to strike is also accepted by many honest Americans as valid proof of the unsportsmanlike character of the Japanese. They point out that Japan waited until the outbreak of the World War to present her "infamous Twenty-One Demands" to China; that she bided her time until the tragic economic depression of the present decade gave her the opportunity to create Manchoukuo; and that the Italo-Ethiopian embroilment was cunningly awaited before Japan inspired North China to revolt. For these reasons, they urge, Japan cannot be trusted. She is a *menace* to world peace, and, in language ever growing in volume and passion, they warn us that Japan must be halted from this mad course, halted by the United States even if it means war. *I am sick and tired of pussy-footing with Japan*, thunders the Chairman of our Senate Committee on Foreign Relations.

Japan is not a vicious country. Her present Government is not militarist. And she does not plan conquest of the entire world. If Americans were only aware of the lessons of their own history, thereby giving the lie to Hegel's assumption that the *one* great lesson of history is that history teaches us *nothing*, they would immediately understand how unfounded were these charges against Japan, and how uninformed or malicious were the people who make them. Senator Pittman, I believe, is uninformed. What possible malicious motive could a native of Mississippi and United States Senator from Nevada have against a friendly people more than four thousand miles away?

II.—Americans who hurl the epithets *vicious*, *menace* and *unsportsmanlike* against Japan would never for a moment admit their application to the United States, and we would sympathize with their perfectly natural reluctance in so doing. Yet justice demands a single standard of morality for all nations, Eastern and Western alike and, using that common measuring stick, those of us who condemn Japan must, by the necessities of the standard, brand the United States with precisely the same epithets. An illustration, as usual, will clarify the point.

Japan's so-called Twenty-One Demands and our highly altruistic Platt Amendment to the Constitution of the independent Republic of Cuba were remarkably similar diplomatic manœuvres. The former have been mercilessly condemned by Chinese and Americans alike as being unique in the history of international relations. "History," writes one commentator, "recalls scarcely another instance in which demands of such a serious character as those which Japan presented to China in 1914 have, without even pretense of provocation, been suddenly presented by one nation to another with which it was at the time in friendly relations."

A hasty examination discloses the fact that Japan's original demands consisted of five general groups, each of which had a certain definite number of articles, adding up to twenty-one in all. The most important group was number five, which consisted of seven separate demands on China all aimed to accord greater safety and protection to Japanese advisers to the Chinese Government, particularly with regard to matters concerning foreign relations and foreign loans. Number four of the group provided for Japanese guarantee of the territorial integrity of China. Number three, the future of an important iron mining and smelting company in China, known as the Hanyehping Company, in which Japanese capital was heavily invested. Number two, mainly with extension of leases in South Manchuria and Eastern Inner Mongolia ; and number one, that China would not interfere with whatever future disposition might be made of existing German rights in Shantung.

When Washington Acted

On May 25, 1915, nearly five months after the demands had been originally made (January 18) treaties were drawn up between China and Japan, and certain Notes exchanged, that apparently closed the incident. The long interim between submission of the demands and their incorporation into treaty-law was caused by China's frantic efforts to play off one or the other of the great Western Powers against Japan and thereby effect a stalemate in the negotiations. But as the whole Western world was engaged in that collective madness called the World War, and Japan herself was allied with Great Britain, France and Russia, China's efforts were fruitless. Only the United States remained, and the Chinese counted heavily on this last bet. We were quick to respond and to counsel " patience and *mutual forbearance*." Many Notes were sent and much water was poured over the dam, but finally on May 11, 1915, we took " decisive " action. Burying our head in the sand, ignoring all precedents and even our own past history, as we are wont to do in matters affecting the Far East, we informed Japan that the American Government could not " recognize any agreement or undertaking .... impairing the treaty rights of the United States and its citizens in China, the political or territorial integrity of the Republic of China, or the international policy relative to China commonly known as the Open Door Policy."

China's passive inactivity was thus matched by that of the American Government, and, needless to say, neither had substantial effect on Japan, except to cause certain modifications out of respect for our feelings in the matter, in her original demands. In the treaties that were drawn up and in the Notes exchanged, China conceded Japan the right to avail herself of Germany's losses in Shantung, and, on fulfilment of certain conditions, Japan agreed to restore Kiaochow to China after the War. The retrocession was made in 1922. With regard to South Manchuria and Eastern Inner Mongolia, Japan accepted much less than she had originally demanded. The matter of the Hanyehping Iron and Coal Company was dropped after extricating a promise on the part of China " not to confiscate the said company, nor, without consent of the Japanese capitalists, to convert it into a state enterprise, nor cause it to borrow and use foreign capital other than Japanese." Group five of the demands was *postponed for later negotiation*, and Japan contented herself with obtaining a nebulous *admission* (which China later denied was binding) that China had no present " intention " of letting foreign Powers set up military establishments on the coast of Fukien province that would be a military menace to Japan.

III.—Four thousand miles across the broad Pacific Ocean certain events had transpired with the turn of the 20th century that, to-day, in the perspective of diplomatic history, place the United States of America in an embarrassing position. Particularly is this so with reference to our " holier than thou " attitude toward recent Japanese expansion. That state of mind to-day, in the light of our own history, can have but one of two foundations, either ignorance or malice. With Senator Pittman it must be the former.

After our quick victory in 1898 had exposed the utter decadence of Spain both on land and sea, we moved to live up to our pre-campaign pledges respecting the independence of Cuba. But we moved slowly, as self-denying states usually do, and for two years we kept Cuba under the protective authority of an American army. Not until 1900 did General Wood's conscience permit him to report that, in his opinion, the citizens of the new republic might be entrusted with conduct of their own affairs, thus giving a tardy though apparently sincere fulfilment of our pledged word. We were still reluctant, however, to cut all the cords binding Cuba to the United States, and final decision was made not to free the Cubans within the immediate future but to tie them securely to the United States through a long series of *conditions* to their *independence*.

The American " conditions " to the independence that we had solemnly promised, and promised unconditionally, are what have been called America's Twenty-One Demands. They were incorporated into our organic law by the Platt Amendment. The story of how they were imposed upon the Cubans, and how they were made part of the fundamental law of Cuba has never been adequately related because the Government of the United States has carefully guarded the secret of their " negotiation." It is from Cuban documents, and from them alone, that historians have derived the information necessary to fill out the picture.

Washington's Demands

Number one of the American demands (as Japan's number four) made the United States the guarantor of the territorial integrity of Cuba. Number two (as Japan's number five) provided for American supervision over the financial matters of the Cuban Government. Number three had no parallel among Japan's demands. We required *in advance* that Cuba recognize our right to intervene in her affairs (domestic or foreign) whenever *we* deemed it necessary. This one was destined to be the great stumbling block in all the so-called negotiations. Numbers four and five of our demands also had no parallel in Japan's. They simply provided that Cuba should ratify *in advance* all the acts of our army officials, over the course of the past two years, and that they continue the sanitation work after the American army had left the country. Number six of the American demands was that Cuba should, for the present, relinquish title to part of what the Cubans understood to be their territory, the Isle of Pines. Number seven (as Japan's number one) demanded that Cuba lease a coaling and naval station to the United States ; and the last of our demands, number eight, was that all the foregoing be embodied in a formal treaty between the United States and Cuba. The ultimatum was to expire in eight months.

The Cuban Committee to investigate these demands arrived in Washington on April 24, and proceeded at once to its appointed task. At the first formal meeting with the Secretary of War the Cuban spokesman explained that the Cuban people were up in arms against the proposed Amendment, that they had thoughtlessly taken faith in the joint resolution of Congress in 1898, and in the terms of the Treaty of Paris, and that therefore they could not understand why they were being cajoled out of their rightful independence. The reply of our Secretary of War was that " he was pleased to hear the foregoing declarations, which he characterized as sincere and frank."

The afternoon of the second day saw the fight open in earnest when the American Secretary of War lighted the fuse to set off the opening gun by expounding on " what he considered to be the *traditional* policy of the United States with respect to Cuba." His words, curiously enough, state the case perfectly (and *officially* too) for Japan in Asia. All that remains is to change the names of the contending parties and to remember that we are a continental empire, therefore our chief concern, as we see it, is the islands lying near to our continent ; whereas, on the other hand, Japan is an island empire, therefore her chief concern, as she sees it, is the mainland of Asia, particularly that part directly across the Sea of Japan, from which a strong Power could crush Japan by one decisive blow.

Speaking *ex cathedra* on this occasion, the Secretary pointed out that Cuba was a " small country whose *proximity* places it within range and under the immediate influence of the United States," that therefore it would be subjected to the 80-year-old policy of the United States not to allow any change in the territorial *status quo* in the Western hemisphere without the approval of the United States. " The resulting Platt Amendment," he continued, " embraces and combines the measures which in the judgment of the United States are necessary and indispensable for the preservation of the Independence of Cuba. This Law has no other object. This is its sole purpose." With reference to our demand that Cuba recognize the "right" of the United States to intervene in her domestic or foreign affairs whenever we deemed it necessary, the Secretary of War pointed out that, "That Clause is simply an extension of the Monroe Doctrine, a doctrine which does not have international force recognized by all nations. The Cubans accept the Monroe Doctrine, and the third clause is the Monroe Doctrine, but with international force." He went on to explain that the usual temptations to armed intervention were not present in Cuba: "There is no profit to be obtained there, nor glory to be acquired."

But that was not all. In case little Cuba should ever become powerful and aggressive, like the United States, our Secretary of War explained how the great Powers play the game of international politics and form the precedents of international law. Speaking of our guarantee of the territorial integrity of Cuba in group *one* of the demands, and our "right" of intervention in group *three*, he continued by saying that those two demands "keep the United States from *appearing* aggressive in the eyes of the other nations when defending the independence of Cuba...... *Good diplomacy consists in so situating oneself that upon the occasion of a conflict arising between two nations it may be the adversary who has violated the law.*"

Coaling and naval stations were next considered, and the Cubans were informed that the United States proposed "only to obtain strategic military points which may serve for the military defense of both countries." The Isle of Pines was omitted from discussion because "some Senators manifested doubts as to the right of Cuba" to that portion of her territory. Of course, our Senators turned out to be wrong. But on this occasion we were adamant, our position once dictated to the Cubans the question was settled, there was no recourse.

Laying Down the Law

The following day, Friday the 26th, conferences were resumed in the afternoon, and, as usual, group three of the demands (intervention) occupied first attention. To answer continued Cuban objections, the Secretary of War rather irritably exclaimed that "the clause under discussion has no other value than that of checking foreign ambitions." But if that is true, argued the Cuban spokesman, and "the United States believes that it has the right to intervene and has the power to exercise the intervention, why does it require our consent?" The Secretary replied that "the expression of that consent enables the United States to carry out its announced purposes more easily with respect to the other nations." Whew! suppose a Japanese spokesman, high in authority, dared utter such a statement with respect to the Asiatic mainland near to her shores? Nevertheless, our attitude when our own interests were involved was made perfectly clear,—if it were not so already,—when Senor Mendez Capote of Cuba proposed the leading question that *in international questions force is the ultima ratio*? Our Secretary replied that "the United States in addition to the material force upon which it relies, seeks the sanction of a legal title, in order that it may intervene, by might and by right..... it desires that it (U.S. intervention) may not be contested by anyone."

With few other important declarations on the part of the American Secretary of War, the Cuban Committee ended the conference, and its members retraced their steps through a maze of official functions to the Constitutional Convention in Cuba, where on June 12, 1901, the Platt Amendment was adopted as an appendix to the new Cuban Constitution. By the establishment of the constitution promulgated on May 20, 1902, our demands were made the organic law of Cuba. The military forces of the United States were then withdrawn. But as further guarantee that our demands might never be changed without our consent, a treaty embodying them was concluded on May 22, 1903; ratified by the President of the United States on June 23, 1904, and proclaimed on July 2, 1904.

IV.—Both Japan's and America's *Twenty-One Demands* were only a logical culmination of long-established diplomatic policy. In fact, the American demands were so logical a culmination of our avowed policy on this hemisphere,—as expressed by President Monroe in 1823 and strongly restated by Secretary Olney three-quarters of a century later,—that the American Secretary of War had explained that the demands were *simply an extension of the Monroe Doctrine.* Nay more! The right to intervene in Cuba whenever we deemed it necessary, and without prior consent of the Cubans (as provided for in group three of the demands), *is the Monroe Doctrine*, he said, *but with international force.*

The Japanese demands were less severe than ours; we openly placed Cuba under the humiliating suzerainty of the United States to such an extent that the Cubans seriously doubted whether their so-called "independent republic" would even be recognized by other countries; whereas, on the other hand, the original Japanese demands (discarded under pressure of American diplomatic intervention), only led to China's recognition of Japan's "special position" on the Continent of Asia. To sum up, Japan's Twenty-One Demands of 1915 were official expression of her Monroe Doctrine for Asia, but it was a Monroe Doctrine of 1823, that is, an original Doctrine, without the "international force" of the Platt Amendment. Our Twenty-One Demands were an *extention* of the basic doctrine by addition of *international force*, outlined in the third (intervention) article.

Japan's original demands were discarded because of the diplomatic intervention of the United States. Ours were made effective because we offered to fight any Power that might interfere, and Cuba had no alternative but to obey. Her position was hopeless: there was no foreign power she could play off against the Colossus of the North as China could and did against Japan.

Japan's demands were presented at a propitious moment, and for that Japan has been condemned. It is part of her policy, say Japan's critics, to take advantage of every opportune moment when no one can interfere to strike the hardest, therefore Japan is vicious and untrustworthy. We Americans imposed our demands on Cuba as a "condition" of her independence, while she was still under the heel of an American army. But that, we insisted, was honorable and just. We Americans are not vicious and untrustworthy. We are righteous and dignified: our hegemony on two continents and the connecting isthmus is part of the divine order of things, our Manifest Destiny; but Japan's policy in Asia (her insistence that territorial propinquity gives her certain prior rights, a special position) is an affront to America and a "menace" to world peace. We are "sick and tired of pussy-footing with Japan."

All this lip service so carelessly given to charges against Japan, —all these unfounded slurs on her national honor,—all this ignorance of the lessons of our own American history with the multiplicity of precedents that are found in our own diplomatic life,—and our blind, ignorant, and unremitting condemnation of Japan on high moral grounds suggests the penetrating, embarrassing wisdom of the old Spanish proverb, which, in the language of a modern "gringo," would be translated :—

"Said the pot to the kettle, 'Get away, blackface!'"

Chinese Railways

According to the report published by the Ministry of Railways, engineering work on three uncompleted national railways, namely, the Canton-Hankow Railway, the Lunghai Railway, and the Shanghai-Hangchow-Ningpo Railway has made much headway during 1934. On the Canton-Hankow Railway laying of roadbed on the Lochang-Tashihmen section has been completed.

Construction work on the Chuchow-Lochang section and the Tashihmen-Chuchow section has been pushed ahead, and the laying of rails between Chuchow and Lukow, has been completed, as also in the vicinity of Hangchow.

The Lunghai Railway, the report says, has been extended during the past year from Lingpao to Tungkwan and thence to Sian. The extension measuring a distance of 132 kilometers was opened to traffic immediately after completion.

As to the Shanghai-Hangchow-Ningpo Railway, construction of the Chientang Bridge was started towards the end of last year under the joint auspices of the Chekiang Provincial Government and the Ministry of Railways, while construction of the Chientangkiang-Tsaoking section is under contemplation.

Turning to provincial railways, the report states that construction of the Yushan-Nanchang extension of the Hanchow-Kiangshan Railway, which measures about 300 kilometers has been progressing rapidly, while construction of the Tungpu Railway running between Tatung in Shansi and Puchow in Shensi is nearing completion. About 300 kilometers on the latter line has already been opened to traffic.

Japan's Offer to Guarantee American Possession of the Philippines

By JAMES TRAPIER LOWE, Ph.D., Carnegie Fellow in International Law

Foreword :—This article is based on unpublished diplomatic correspondence from the Japanese Government making formal offer to guarantee by force, if necessary, American possession of the Philippines after the defeat of Spain in 1898. It would appear that Japan feared on that occasion that American annexation of the Islands might be opposed by the same Powers that had forced her to retrocede the Liaotung Territory in 1895 at the conclusion of the Sino-Japanese War. Determined that *the Liaotung lesson must not be forgotten*, Japan offered to guarantee by force American possession of the Islands in full sovereignty, or to form a tripartite protectorate—Japan, Great Britain and the United States. *Would Japan go that far to-day?*

This article substantiates the hitherto unsupported reports of how the late Admiral Viscount Saito, then a Captain in command of the *Akitsushima*, lined up with Captain Chichester of the British Navy, and placed his vessel between the German squadron and Dewey's fleet in Manila Bay, when it looked as though Germany would attempt to repeat the "Liaotung high-jacking" methods and deprive Dewey of the fruits of his victory.

The events of that year have been shrouded in diplomatic obscurity. The American Navy remembers Saito and holds him in great respect. The article however, discloses, that instead of acting on his own initiative, as has been surmised, he followed a well-defined policy laid down by Tokyo. It is a pity that this story could not be amplified from the records of the Japanese Government, which if released, would help to clear up many misconceptions and counteract the propaganda of Senator Pittman, Roy Howard and others.—G.B.R.

* * *

America's impending withdrawal from the Philippines in 1946 raises national and international issues of grave importance. This was exemplified in unmistakable manner on December 10, 1935, by Roy Howard's frank letter exposing the whole problem. Setting forth the views that he had derived from a personal inspection of the principal islands and provinces from northern Luzon to southern Mindanao, he wrote that intelligent Filipinos no longer wanted independence; that they were literally scared to death of being gobbled up by Japan once the protective influence of the United States was removed; and that, as a result:

> [1] "Congress will be requested sometime early in the ten year interim, to make the Commonwealth form of government permanent and definitely fix its political and economic future on a territorial basis."

Not only that. The present status of the Philippines in the community of nations raises important international issues. Are they a commonwealth such as the Dominion of Canada or the Irish Free State in the British Commonwealth of Nations? Should they be represented, as are Canada and the Irish Free State, in the League of Nations at Geneva and at foreign state capitals? What, from the standpoint of international law and political science, is their status?

Briefly, it may be said that in spite of evidence to the contrary (such as Paragraph 7, Section 11, Article 7 of the present Constitution of the Philippines, granting to the President of the Commonwealth the power to make treaties, appoint ambassadors, other public ministers, consuls, to receive ambassadors and other ministers accredited to the Government of the Philippines) the government is in no sense on the same political plane as the Dominions of the present British Commonwealth of Nations. The Dominion status was defined by the Balfour Declaration in the Imperial Conference of 1926, and was incorporated into organic law of the empire by the Statute of Westminster, 1931. The Declaration was as follows:

> [2] "They are autonomous Communities within the British Empire, equal in status, in no way subordinate one to another in any aspect of their domestic or external affairs, though united by a common allegiance to the Crown, and freely associated as members of the British Commonwealth of Nations."

The Philippines, on the other hand, have certain weighty restrictions on their so-called independence. In an *Ordinance Appended to the Constitution* some of the more important of these are listed. All Filipinos owe allegiance to the United States: they accept and recognize our supreme authority. The Congress of the United States has full supervisory power over the financial stability of the Philippines; no foreign loans are valid without our express approval. Any act affecting currency coinage, imports, exports, and immigration must have express approval of the President of the United States. Conduct of all foreign affairs is under the direct supervision and control of the United States. The President of the United States has complete authority over the Army and Navy of the Commonwealth. Our Supreme Court has plenary jurisdiction over all legal decisions by native courts. The Philippine Constitution cannot be amended without approval of the President of the United States, and the American President has an absolute veto on all acts of the Philippine legislature. Of course, United States intervention whenever we deem it desirable or necessary is carefully provided for in advance and the Filipinos waive all objections. The Commonwealth therefore, would seem to be, as matter of fact, still very much of a dependency of the United States, not by any means a sovereign state in international law and political science.

II.—The expressed desire of Filipinos for continued political association with the United States to offset the dark shadow cast across the islands by recent Japanese expansion brings to mind an important and significant chapter in American history. It is a chapter that has never been adequately completed because the Government of the United States has never officially published the diplomatic documents bearing on the case. It has been my pleasure to examine these documents, and I derived therefrom information that throws considerable light on the tangled issues of twentieth century American policies in the Far East, particularly as they affect the empire of Japan, and the traditional friendship between that country and the United States of America.

When Dewey took command of our Far Eastern squadron in October, 1897, he was ordered to attack the Spanish at Manila. This he did on May 1, 1898, gaining a great naval victory without the loss of a man. Dewey, promoted to status of Acting-Admiral after the victory, did nothing toward capture of the City of Manila for almost three and one-half months. This delay was occasioned by two important facts. First, Dewey did not have sufficient landing force to hold the city after capture; and second, his only object in engaging the Spanish fleet had been to protect American commerce in the Pacific, and possibly our own west coast against reprisals by Spain. Capture of Manila City was, therefore, not one of Dewey's immediate objects, and seemingly it could serve little purpose. Annexation of the Philippines, at that stage of the game, was certainly no fixed idea in the minds of Americans.

Meanwhile, what was the attitude of the other great powers in the Far East toward our maneouvres in Manila Bay? What would their reaction be should Dewey capture Manila City? or America annex the Philippines?

It was known beforehand, as a result of Japan's experience at Shimonoseki, that Russia, Germany and France would oppose the United States, or any other power, for that matter, which attempted to improve its position in the Far East. It was also known in informed circles that the British would support the Americans against the greater menace of the expanding French and German empires: Fashoda and the Boer War were not far off. But what would the attitude of Japan be? Japanese vessels were in the harbor, and the people of Japan were keyed to fever heat over the impending crisis. Would Japan support us in this, our struggle for empire in the East? On the answer to that question should have depended the future trend of Japanese-American diplomatic relations. That it did not is due to two causes: first, the ineptitude of our Far Eastern diplomacy following the incident; and second, American popular ignorance of Japan's rôle in this crisis.

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[1] *The Washington Daily News*, December 10, 1935.

[2] Wheare, K. C.—*The Statute of Westminster*, 1931,—Oxford, 1933, The Clarendon Press.

On April 29, 1898, the American Minister to Japan, Buck, wrote to the American Secretary of State, assuring him that a:

> [3] "Proclamation of Neutrality would be issued—Marquis Ito stating that it was then in the course of preparation. Owing to lack of a suitable precedent in the archives of the Foreign Office, the preparation of this proclamation in due form takes longer than would otherwise be the case. This fact accounts for the present delay. I am assured that the proclamation will be promulgated within the next few days. Judging from the comments of the Japanese press upon the war between the United States and Spain, public opinion in this country seems to be in sympathy with the United States rather than Spain."

On May 2, 1898, Japan issued her official Proclamation of Neutrality, dated April 30, and on the following day, May 3, a telegram was received in cipher by the State Department that:

> [4] "Government of Japan is to send three war vessels to Philippine Islands to observe naval operations and to protect Japanese subjects."

The Spanish fleet was destroyed at Santiago on July 3, and the French Ambassador at Washington was instructed to ask McKinley for terms of peace. On July 8, the President of the United States signed a joint resolution of Congress approving annexation of Hawaii. Japan formally protested on this occasion, and her legitimate Protest carried the latent suggestion that any further territorial acquisitions in the Pacific by us or anyone else would not only disturb the *status quo* in that region but would throw the whole question wide open—perhaps, it was hinted,—for the survival of the fittest.

We met that legitimate opposition by dictating the terms on which the acquisition would take place: absolute extinction of all treaties, predominance of American interests. A Hawaiian newspaper described our attitude as being that:

> [5] "The annexation of Hawaii is for the benefit of the Hawaiian, the Latin and the Anglo-Saxon races of these Islands. It is not and it does not pretend to be for the benefit of the Asiatic. It is meant as a bar to the Asiatic."

All the while, over one-fourth of the *entire* population of the Islands was Japanese; they outnumbered the British more than ten to one; the Germans more than twenty to one; the French more than two hundred to one; and the Americans more than seven to one.

> [6] "It says these beautiful Isles," continued this inspired editorial, "with their soft climate, and their exuberant soil, with the blue waves lapping their coral girt shores are to belong to the West not to the East. They are to enjoy in freedom the same civilization, have the same lofty ideals, worship the same God as do their brethren of the vast Continent of North America."

What would popular reaction in Japan be to this example of high-handed annexationist diplomacy? An editorial in *The Yorodzu Chocho*, Tokyo, June 24, 1898, answers this question:

> [7] "We have no reason whatever to object to the probable proceeding of the great Republic. On the contrary, we would very much like to see Hawaii in the hands of the Americans. . . . The annexation of Hawaii by America does not in the least affect our interest . . . we hope the Americans will keep the Philippines too."

On July 6, our Minister to Tokyo reported reassuringly:

> [8] "The Government as well as the press of Japan continue to express a friendship for the United States."

Again, on August 13, the American government was informed by its Minister:

> [9] "I have the honor to state that the feeling now, as expressed in the public press, as also in other ways, seems to be quite universal in Japan that the United States should take, possess and govern the Islands in the interest of peace and commerce and to insure good government, with the moral support at least, if not the active support of Japan.

The Japan Daily Mail carried an important editorial on this subject, on August 8, 1898, under the heading (which in itself is significant), *America, Japan and England:*

> [10] "There is evidently a strong impression in Japan that the Tokyo Government has taken a decided line about the Philippines, and that this country and Great Britain will be drawn closely together by the event. Japan would be more than human if she failed to welcome this opportunity of paying off some of the Liaotung (Manchuria) score. Russia, France and Germany combined to deprive her of the fruits of her victory in Manchuria, and there are strong indications that the same league of Powers will interfere to prevent America from dealing freely with the territory she has conquered in the Philippines. . . . It is essential, however, to guard against another surprise. The Liaotung lesson must not be forgotten. Before any triple alliance can step into the field in connection with the Philippines, an alliance to oppose it must be concerted and ready. Evidently the leading vernacular Journals think that these facts are recognized, and have become the basis of active procedure, by the Foreign Office in Tokyo."

The day following this significant editorial, *The Japan Gazette*, Yokohama, carried this analysis of the crisis:

> [11] "In striking a blow at Spain with a view to speedily terminating the war the United States Government landed troops upon Philippine soil; their operations against the Spanish forces revived the dying embers of the rebellion, and they cannot now evade the responsibilities that have been created. The Japanese Government, we doubt not, see clearly that in American occupation of the islands will be the only escape from a serious situation—it remains indeed to be seen whether it will actually be a means of escape; and realize that there should be an understanding as to what shall be done in case the United States are told 'hands off' as in the case of the Liaotung Peninsula."

The *Japan Daily Herald* carried another important statement (August 6, 1898):

> [12] "The acquisition of the Islands by any other Power save America would constitute a menace to peace in the Orient. . . . It behooves America, England and Japan to keep a keen watch on the Islands in order to prevent, by force if necessary, any aggressive action on the part of other countries."

Finally, on Thursday, August 11, 1898, the *Yorodzu Chocho* wrote:

> [13] "It is becoming more manifest as days go on that Germany, France and Russia are secretly planning to play a sinister trick upon America about the question of the Philippines, just like the one they did upon Japan with regard to her victory in Manchuria. . . . Japan should therefore do her best, even at the risk of a war, to prevent the occurrence of such a turn of events. . . Let us then join hands with Great Britain and America, the two most progressive and enlightened nations of the world."

This fan-flare of popular appeal from the Japanese people did not go wanting. Two official dispatches, dated September 8 and 16, respectively, from the Japanese Government, bear testimony to this. In the first (marked "Confidential"), the government of Japan authorizes its Chargé d'Affairs to present,

(Continued on page 165)

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[3] *Diplomatic Corres.* (in Mss) Department of State.
[4] Ibid.
[5] *The Hawaiian Star*, September 9, 1897.
[6] *The Hawaiian Star*, September 9, 1897.
[7] *The Yorodzu Chocho*, Tokyo, June 24, 1898.
[8] *Diplomatic Correspondence* (in Mss) Department of State.
[9] *Diplomatic Correspondence* (in Mss) Department of State.
[10] *The Japan Daily Mail*, August 8, 1898.
[11] *The Japan Gazette*, Yokohama, August 9, 1898.
[12] *The Japan Daily Herald*, August 6, 1898.
[13] *The Yorodzu Chocho*, August 11, 1898.

JAPAN'S FINANCES

Free Translation of a Lecture Delivered by Dr. Eiichi Baba, Minister of Finance, at the Tokyo Imperial University in September, 1935

The problem of deficit-covering bond issues is a timely topic. Public attention has never been more acutely centered than at present on the output of bonds, the unbalanced State Budget, the possibility of equilibrium on both ends of the Treasury account, the nation's ability to absorb further flotations and other pertinent financial questions. It is apparent to everybody that the crux of the problem lies in the magnitude of appropriations for national defense. In the General Budget for the 1935 fiscal year, the colossal sum of Y.1,020,000,000, or 46 per cent of the total expenditures, is set aside for the Imperial Army and Navy, to say nothing of the outlay in other Ministries which contribute indirectly to the maintenance of the fighting services. We will fail to estimate properly the significance of this huge appropriation unless due account is taken of the situation which necessitates such a stupendous outlay.

The impelling reasons for these vast war preparations, arise from the basic fact that the satisfied nations of the world attempt to justify their maintenance of the *status quo* by retaining control of colonies and raw materials exclusively for their own benefit, leaving the poorer nations to eke out an existence on too scanty natural resources. Great Britain, the United States, France and other sated nations are unwilling to throw open their excess possessions to Germany, Japan and Italy, all lacking in natural resources and suffering from the pressure of surplus population.

The pacifism of these satisfied nations arises from a desire to hold rising nations in check and maintain the *status quo* at the expense of the poorer nations. For this reason, the independence of Manchoukuo and Japan's assistance to that new state were branded as unjustifiable, fearful that existing interests of the satisfied nations would be impaired by the expansion of Japan. So long as this Western pacifist theory is accepted, those nations blessed with abundance will maintain the *status quo* and decline to sacrifice any of their possessions, even those that were acquired through unfair methods in the past. The justice of Japan's policy towards Manchoukuo will never be given fair consideration.

Dr. Eiichi Baba, Finance Minister

Menacing Factors

Japan left the League of Nations, but no sanctions were enforced. Nor have sanctions been applied to Germany for deserting the same institution. If Italy should follow their example, the League will find it difficult to apply effective measures. Because of these facts, we cannot lightly ignore national defense, nor can we sacrifice adequate armaments to world pacifism. This is especially true in view of the presence of the Soviet Union on the neighboring continent and the United States across the Pacific Ocean.

We cannot disregard the urgent necessity of adequate armament preparations. It was a forlorn hope to attempt to carry out Japanese disarmament objectives at the Naval Conference in London, for the reason that the world is tending more and more to armament expansion than to its reduction. The situation obliges us to formulate our policies and support our diplomacy by strong armaments. It is for these reasons that increased expenditure for national defense was necessary in the past, and why we must expect a probable increase in the future.

The General Budget for the fiscal year 1935 reaches a total of Y.2,215,000,000, the largest in recent years, a great disparity as compared with Y.1,500,000,000 for 1931. Of this, appropriations for the army and navy account for Y.1,022,000,000, or 46 per cent of the total. On the other hand, the income of the Treasury is barely Y.1,335,000,000, including Y.828,000,000 from various taxes, Y.82,000,000 from stamp revenue, Y.276,000,000 from Government enterprises and properties, and Y.148,000,000 from all other sources, leaving a deficit in round figures of Y.1,000,000,000.

How should this deficit be balanced ? Some propose that taxes be raised, bonds converted into new issues bearing lower rates of interest, and the administrative system reformed so as to dispense with unnecessary expenses. Others suggest turning over the surplus earnings of the State railways and communication enterprises to the general account, raising postal charges, discontinuing subsidiary aid to the Korean Government, and making the Formosan Government contribute its share to the Treasury. Still others insist that State monopolies be extended to sugar and liquor and that the inheritance tax be drastically raised to obtain new revenues.

These various proposals would increase the Treasury income, and I have no hesitation in approving them in principle, but the fact should be borne in mind that, in this country, annual incomes of more than Y.5,000 are comparatively few. Those of more than Y.10,000 are still less. A heavier tax on higher incomes, will therefore provide a very limited sum. On the other hand, the lower classes with smaller earnings constitute a greater tax-bearing stratum, due to numbers. But it is inconsistent with the social welfare policy that has of late been given increasing emphasis, to impose further burdens on this class.

Concessions to Tax Payer

Social welfare is a timely administrative principle, but to date its application has deprived the Treasury of a large annual revenue. In pursuit of this policy, the Government has done away with the stamp duty on patent medicines which was only Y.0.01 per wrapping ; the traffic duty, which was also Y.0.01 per return trip for short distances, and the excise duty on " Shoyu " (a sort of sauce, peculiar to the Japanese table, brewed of barley), and on cotton piece-goods. The result, however, does not appear to have relieved suffering to any appreciable extent, or to have created a sense of gratitude in the public mind. Instead, there has been a heavy decrease in the State income. If these duties were again enforced, the Treasury would benefit by scores of million yen annually, including some Y.15,000,000 from the traffic duty, more than Y.10,000,000 from cotton piece-goods, Y.10,000,000 from drugs, and Y.6,000,000 or considerably more than that, from shoyu. There may have been some justification in discontinuing these duties with the idea of resuming them in the event of war, but even then they would be difficult to impose and collect suddenly. It is not sound policy to abolish existing taxes for the advancement of social welfare measures.

This is even more true in the case of those taxes which have long been collected without directly affecting the public. The profits of railway operation are often cited as available for relieving the difficulties of the General Budget, but the proposal fails to take into consideration the primary consideration indispensable for the maintenance of the railways themselves, such as, repairs and improvements, building of new lines and feeders, and depreciation, which involve large annual expenditures. If these be taken into account, the amount that may be turned over to general finance will not be very large.

It is inadvisable to discontinue or reduce drastically the State subsidy to the Korean Government. A monopoly on liquor is also fraught with difficulties. It is possible only when beverages are sold at exorbitant prices, to the detriment of consumption, while the Government will be compelled to issue a large amount of bonds to compensate the owners of plants and breweries taken over, and in such a volume that the monopoly would prove unprofitable. The proposed monopoly on sugar, may bring a profit to the Treasury, if properly enforced. But the Japanese sugar industry has already outgrown local consumption, and export trade must be fostered if present productive facilities are to be maintained. A State monopoly is incompatible with the requirements of export trade.

The conversion of bonds into lower interest bearing issues would seem as one way of reducing the burden, but the amount thus saved will be no more than Y.27,000,000, if all the 5's and 4.5's are converted into four per cent bonds. No large sum is likely to be saved by reform of the administrative system. Consequently, all the proposed measures discussed above will hardly serve, at least to any remarkable extent, to reduce national expenditures or increase income in general.

The only available method of improving State finance is, after all, an increase in other taxes and the augmentation of profits from Government enterprises. The last plan cannot be worked out intelligently or put into force effectively unless it is possible to draft a definite outline of future State finance or, in other words, unless there is some settled program for future expenditures.

A Study of Values

In this problem, the expenditures for defense plays by far the most important part. People are apt to regard these appropriations as unproductive. I do not share this view. I refrain from using the word " unproductive," despite the fact that some portions of these appropriations are spent in such a way as not to produce directly anything new. If these appropriations may be termed unproductive, other items, such as, for instance, the cost of education, may also be termed non-productive, for the latter has often produced communists and other useless elements.

There are other people who consider defense expenditures as a necessary bulwark against foreign aggression. There is no denying that we may evade an inevitable war if we have adequate armaments, and we may move forward overseas and promote our trade interests throughout the world by dint of our defensive strength. As for internal effect, the appropriations are maintaining, as is so often stressed by the navy authorities, the bulk of the heavy and light industries of the country. In these respects, the spending may well be termed a productive investment.

Whatever may be the arguments advanced, and judging from the domestic as well as the international situation, the defense appropriations of Japan are not likely to decrease despite the desire of the nation to disarm. It was urged that the defense services and agricultural element should be given an equal amount of encouragement, as the tripartite health-armament, agricultural and finance—is essential for the sound development of the country. The allocation for the first, which totals Y.1,022,000,000 during the present fiscal year, is more likely to increase than to decrease in the future.

We are ready to stand the cost, not so much in anticipation of war, as in expectation of evading future hostilities. An example is not far to seek. At the time of the Shanghai Incident, it is conceivable that Japan may have emerged from it without a war with the United States, solely because of her greater naval strength. While we recognize the many merits of armament for peaceful purposes, we cannot tolerate unlimited armament expenditures, the increasing scope of which is uncertain and unregulated. It is impossible to work out a definite finance program if a fixed sum be spent this year by floating a corresponding amount of bonds, while an uncertain but far larger sum may be asked for next year calling for still more bond issues. An unfavorably balanced Budget increasing without limit year after year, is a constant source of financial unrest.

Needless to say, an unlimited expansion in the amount of bonds issued will give birth to harmful inflation, accompanied by a precipitous decline in the exchange rate and a soaring of the commodity price level, undermining the finance and economy of the nation. What concerns us most, is not the amount of deficit covering bonds, no matter if it be Y.1,000,000,000 or even double that amount a year, but the problem of how much the amount is likely to increase in the future.

I do not worry about the issuance of bonds as a means of covering deficits. Under present circumstances the deficit must be met through bond issues. What is absolutely essential is to know definitely the scope and extent of future increases. With this ascertained, we can establish a financial program applicable for many years to come, at least for the next several years. If the increase is enormous, we shall have to consider an increase in the existing general tax scale. Increase of taxation has an important political significance for the nation at large, as the people, being conscious of the amount of war appropriations they have to meet, will endeavor not to dissipate the war fund.

Aid for Farmers

Japan is now called upon to give most sympathetic consideration to the agricultural classes, who constitute the backbone of the nation. In order to lighten their burden, the Government has already expended large sums in the form of civil construction, building and other relief works. I deplore the fact, however, that these measures not only failed to benefit the people but imposed an excessive burden on the local governments. Due to the unfortunate plan of these relief enterprises, it was imperative that all localities defray part of the expenditures involved, which was raised through loans, and other forms of public debt. As a result, all the regions concerned have been plunged deeper into debt, without knowing how to meet the principal and interest payments on due dates. All such enterprises started in the future, must therefore be carefully studied so as to avoid extra burdens on the municipalities or prefectures.

The interest rate has declined steadily during the past few years. Until 1932, Government bonds, with one or two exceptions, were issued at five per cent per annum, but all subsequent issues bear 4.5 per cent. This lowering of the interest rate is due in part to the Government's policy but more largely to the general economic trend. It will continue at the present level or decline further for some time to come.

The decline is already causing difficulties. Many banks, especially those with a large capitalization, are overloaded with non-negotiable assets on account of too narrow a margin between deposits and advance interest. Many who are living on bank cash deposits are also finding their incomes decreasing year after year, while at the same time the general public is inclining more and more towards speculation in the share, commodity and other exchange markets, in an attempt to make better use of their cash holdings. It is incumbent on the Government and financiers to warn the people against speculation and preference for commodities to cash deposits.

The Prospect of War

As a last problem, I have to consider, whether Japanese financial organs can perform their proper functions in the event of a future war. It is not from a desire for battle that our defense services are maintained, but we cannot afford to delude ourselves into a belief that war will never come. Therefore, the possibility of war should always be kept in mind in formulating the principles for our State finance, economic structure and financial organs.

It is true that the Government exercises a certain control over the financial organs of the country through the Bank of Japan, Yokohama Specie Bank, the Hypothec Bank, Industrial Bank of Japan and other special banks, and the primary policy of the Finance Ministry is to protect the interests of depositors in ordinary

(Continued on page 186)

Fifty Years of Railways in Malaya

1885-1935

FIFTY years ago, on June 1, 1885, the line from Port Weld to Taiping was opened. This line, 8¼ miles long, was the first railway to be constructed in the Malay Peninsula.

The Perak Government, at the time, had no engineers with experience of railway construction, so it commissioned the Ceylon Government to carry out the work, and on completion the line was taken over and operated by the Perak Government. This line which now carries only one goods train a day in each direction was then of considerable importance linking up the mining center of Larut with Port Weld, which in addition to being a port of call for local steamers, was the center of supply of the mangrove firewood then extensively used by the mines.

The Taiping terminus of the Port Weld line occupied the present site of the King Edward VII School Padang and the Railway Headquarters offices were near the Rest House and are now the Sanitary Board and certain other Government Department offices. Taiping station was later moved to its present site.

In 1888 extensions to Kamunting and Kuala Kangsar were contemplated. In his Annual Report for 1888, the Resident Engineer and Traffic Manager writes :—

> "The necessity for railway extension to Kamunting is now more evident than it was when I sent in my last Annual Report. The traffic on the cart road has considerably increased, and cattle disease has enhanced the rates for cart hire, it now being cheaper to send a load of rice from Port Weld to Taiping (eight miles) than from Taiping to Kamunting (3½ miles). The freight for 50 bags of Bengal rice from Port Weld to Taiping is $3.50 including loading and unloading charges, while from Taiping to Kamunting it varies from $3.50 to $3.75, the carts being loaded by the railway.
>
> Such heavy transport charges must militate against the opening up and working of mines in the Kamunting District and beyond.
>
> A line to Kuala Kangsar might not prove immediately remunerative, but it would not be an expensive line to construct, there being no heavy work except at 'The Pass.'
>
> One of the advantages immediately following would be the reduction on carriage of goods to about one half of the present rates, and Kuala Kangsar would be brought within 1½ hours of Taiping."

Construction of the line to Kamunting was commenced on September 30, 1889, and the line was opened by the Resident on May 6, 1890.

In June, 1891, work commenced on a further extension northwards from Kamunting to Blanda Mabok, since renamed Ulu Sapetang on representations made by the Dutch Consul. This section was opened for traffic on July 1, 1892.

It is interesting to note from the Annual Report of the Resident Engineer for Railways that the opening of this section was delayed through the failure of the sleeper supply. Railway construction has been similarly handicapped on many occasions.

Meanwhile during 1891 contracts were let for the construction of the Kinta Valley Railway from Ipoh to Tapah Road, a distance of 34 miles, and from Tapah Road to Teluk Anson ; surveys were also made for extensions from Ulu Sapetang to Selama and from Taiping to Kuala Kangsar.

In 1893 the contract for the construction of the line from Ipoh to Tapah Road was cancelled, and in his report for 1893 the Resident Engineer for Railways states :—

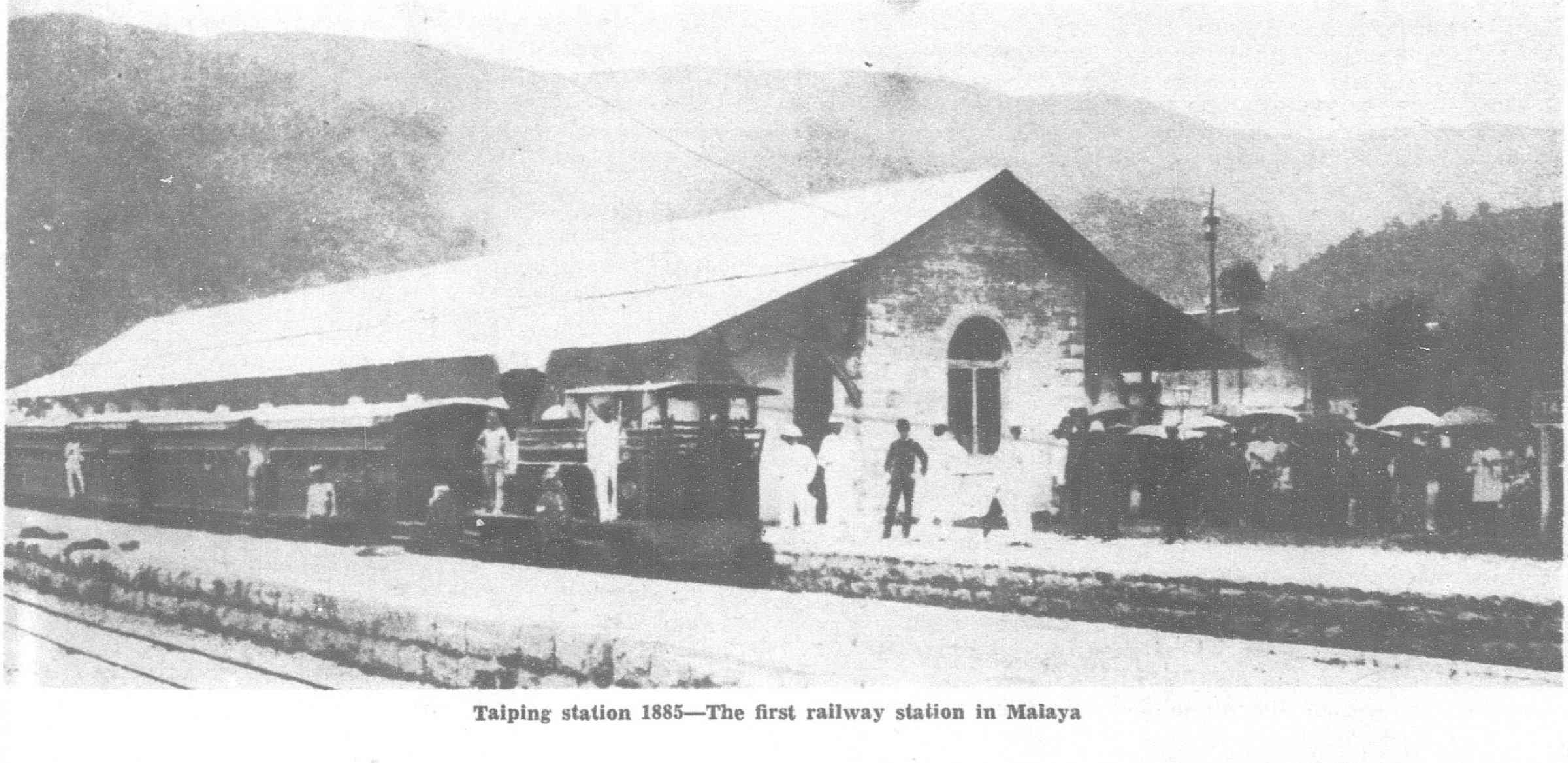
> "I think I may safely say that experience has shown that in Perak it is not advisable to let the Railways by contract.
>
> My experience of Railway work, at the Cape, in Ceylon and here, is conclusive that, with an efficient staff, a Government can construct its own Railways more economically and expeditiously, and ensure better work, than if a contractor is employed."

It may be mentioned here that from this date all Railway construction undertaken by the F.M.S. Railways has been carried out departmentally, or at piece work rates under the supervision of Railway Engineers.

During 1893 the line from Teluk Anson to Tapah Road was opened for traffic, also a portion of the Kinta Valley Railway from Ipoh to Batu Gajah which was extended to Kota Bharu in 1894 ; during the latter year a section of this line from Tapah to Talam was also opened to traffic.

In the Annual Report for 1894, the Resident Engineer for Railways writes under the heading "Occurrences" :—

> "On the evening of September 17, a passenger train from Tapah Road to Teluk Anson came into collision with a wild elephant, at about three and a half miles from Teluk Anson.

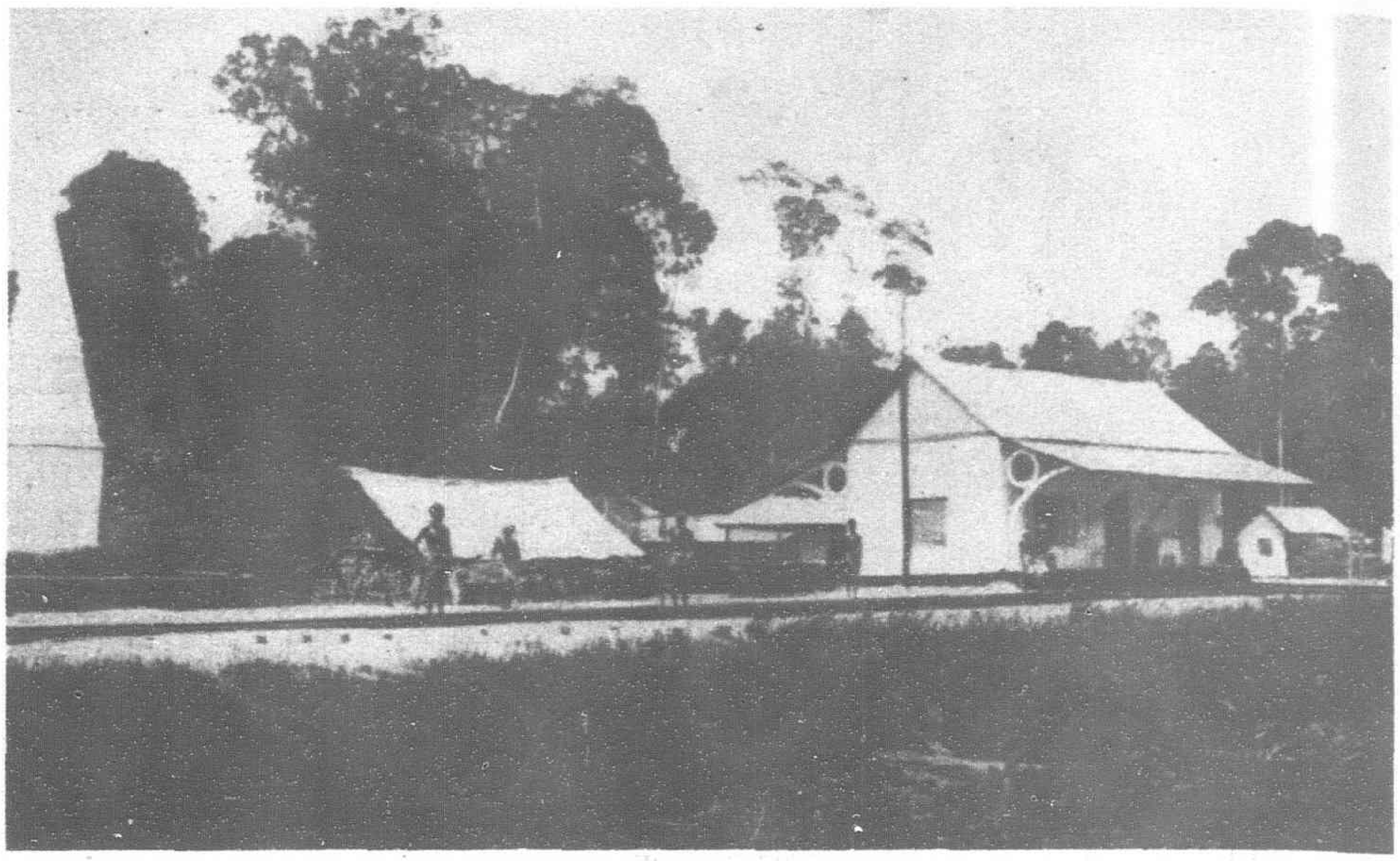


Taiping station 1885—The first railway station in Malaya

The engine and tender were derailed and the line was blocked till September 22. No one was injured and the passengers walked into Teluk Anson, but the driver was thrown off his engine into the jungle by the side of the line."

The head and tusks of the elephant are now in Taiping Museum together with photographs of the occurrence which is also commemorated on the spot by a monument reproduced below.

During 1895, the East Section of the Kinta Valley line was completed, thus linking up Ipoh with the Port of Teluk Anson. It is worthy of note that nowhere in the annual reports is mention made of any projected railway from Ipoh to Lumut. The construction of the Kinta Valley line suggests that Teluk Anson was designed to be the Port for Kinta, and in the words of the Resident Engineer "The opening for through traffic was accompanied by an immediate rise in the monthly receipts."



Simpang station—Port Weld Branch—from a photograph taken in 1886

In the same year construction was commenced on an extension northwards of the Kinta Valley Line from Ipoh to Tanjong Rambutan and Chemor. The extension was opened in 1896, and further extensions northwards were completed to Sungei Siput in 1897, and to Enggor in 1898.

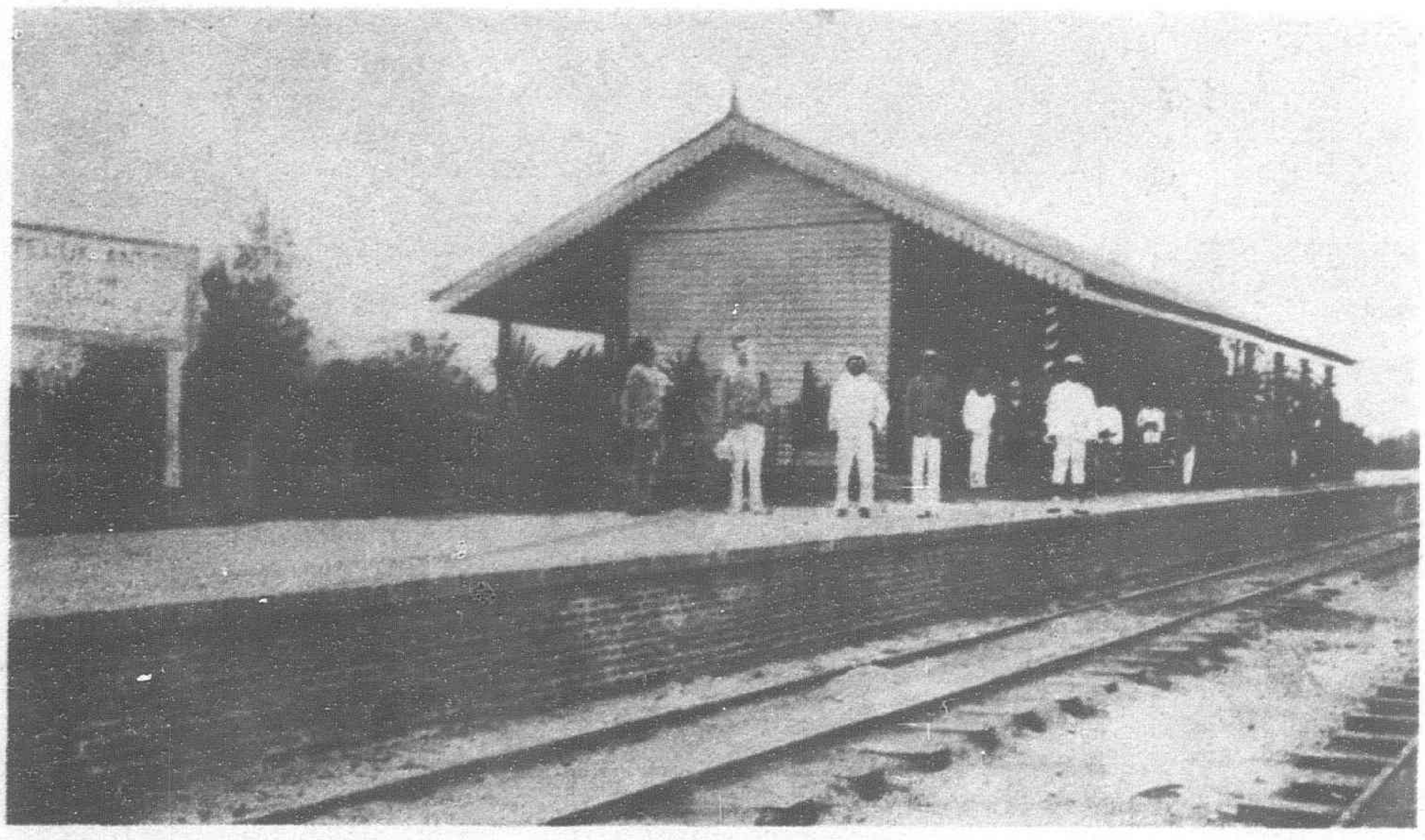
In 1896 surveys were completed from Prai to Bagan Serai and from Ulu Sapetang to Bukit Merah, the projected line from Ulu Sapetang to Selama having been abandoned in favor of a more circuitous route via Pondok Tanjong, Bukit Merah and Bagan Serai.

During 1897, the difficult task of finding a route over the Pass between Taiping and Padang Rengas was seriously undertaken. Two routes were surveyed each involving the construction of three tunnels. In the Annual Report for 1897, it is stated: "An immense amount of work has been done on the survey through the Pass in order to select the best possible route, a large extent of the ground has been contoured, and cross sections have been taken 50 feet apart on the center line for a distance of 5½ miles."

The Pass Section was commenced in 1898 and completed in 1903, and for some time this was the only gap in the line between Kuala Lumpur and Prai, through passengers had to undertake the journey between Padang Rengas and Taiping by gharry.

Work on the Perak River Bridge at Enggor was commenced during 1897; but was suspended at the end of the year owing to the high floods which occurred in December as a result of which the rail level was raised by six feet. This was fortunate, as had it not been so raised the floods of December, 1926, which rose several feet higher than that of 1897, would no doubt have caused considerable damage to or completely destroyed the bridge. Construction was resumed early in 1898 and the bridge completed in 1900.

1898 was a year of intensive railway construction. In addition to the Taiping—Kuala Kangsar section, work was in hand between Prai and Ulu Sapetang and also to the south between Tapah Road and Tanjong Malim, and in 1899 work on the section Enggor to Kuala Kangsar was commenced.



Teluk Anson station, 1893

In 1899, the first section in Province Wellesley was opened from Prai to Bukit Mertajam, this was extended to Nibong Tebal in 1900 and in 1902 joined up with the system in Perak. In connection with the Railway in Province Wellesley, Sir Frank Swettenham wrote in *British Malaya*:—

> "The Malay States made, and paid for, the Province Wellesley Railway, and no benefit so great has ever been conferred on Pinang in the history of the Settlement, but the people of this place were slow to appreciate the fact and have never been demonstrative in thanks to the Malay States.... ...."

Through communication by rail between the Perak/Selangor boundary at Tanjong Malim and Prai was established in 1903.

Selangor

The first Railway in Selangor was opened in 1886 and extended from Kuala Lumpur to Bukit Kuda near Klang. Later the old Connaught Bridge over the Klang River was built and the Railway extended to Klang in 1890 from where sidings extended to the river bank and suitable wharves were constructed to accommodate local steamers. These wharves were situated near the Klang end of Belfield Bridge.

The first Kuala Lumpur Station was a temporary structure with an attap roof sited near the present Customs Godown in the Goods Yard. In 1892, a permanent station was built on the present site which in turn was replaced by the present station commenced in 1909 and completed some years later.

In 1889, construction was commenced on the Ulu Selangor Line from Kuala Lumpur to Rawang and thence to Kuala Kubu. This line was opened to Rawang in 1892, to Serendah in 1893 and to Kuala Kubu (now Kuala Kubu Lama) in 1894.

The Annual Reports of the Resident Engineer, Selangor Railways, are much longer and contain more detail than those of his contemporary in Perak. Items of interest appearing in the 1891 Report are as follows:—

> "........a small private station has been built for the use of the Resident at a point where the line runs through the Residency grounds. It consists of a reception room, waiting room and telegraph office, with a large over-hanging verandah covering the platform.
>
> During the year I have made two journeys into Pahang with a view to selecting a suitable pass to carry the Railway into Ulu Pahang.

I have now been over Ginting Peras into Jelebu, Ginting Bidei into Bentong, Ginting Sempah into Bentong, and through Ulu Semanko into Tras and Raub.

Of these Ginting Peras is undoubtedly the best route, if the difficulty of the descent on the Jelebu side can be overcome.

Owing to the unfavorable report by a surveyor deputed to report on this scheme, the preliminary survey of a route by this pass was left in abeyance. I am of opinion, however, that this pass should be very carefully explored with a view to being able to descend in a northerly direction.

Towards the end of the year I received instructions to report on the construction of a line of railway to Pudoh—a mining village, two miles to the south-east of Kuala Lumpur.

I commenced a survey of a proposed line to Sungei Dua, the site on the Klang Straits of the proposed wharves and harbors for Selangor.

At the end of the year a very good line had been selected, and boring operations on the river and at Kuala Sungei Dua were at once put in hand, to enable estimates to be made of the cost of a bridge across the river and the wharves at the coast.

I was surprised on going over the swamps from Klang to Kuala Sungei Dua, to find that the ground is so much firmer than it appears to be from the river; and, from what I could then see, I do not anticipate a great deal of difficulty in the construction of a line to the Straits."

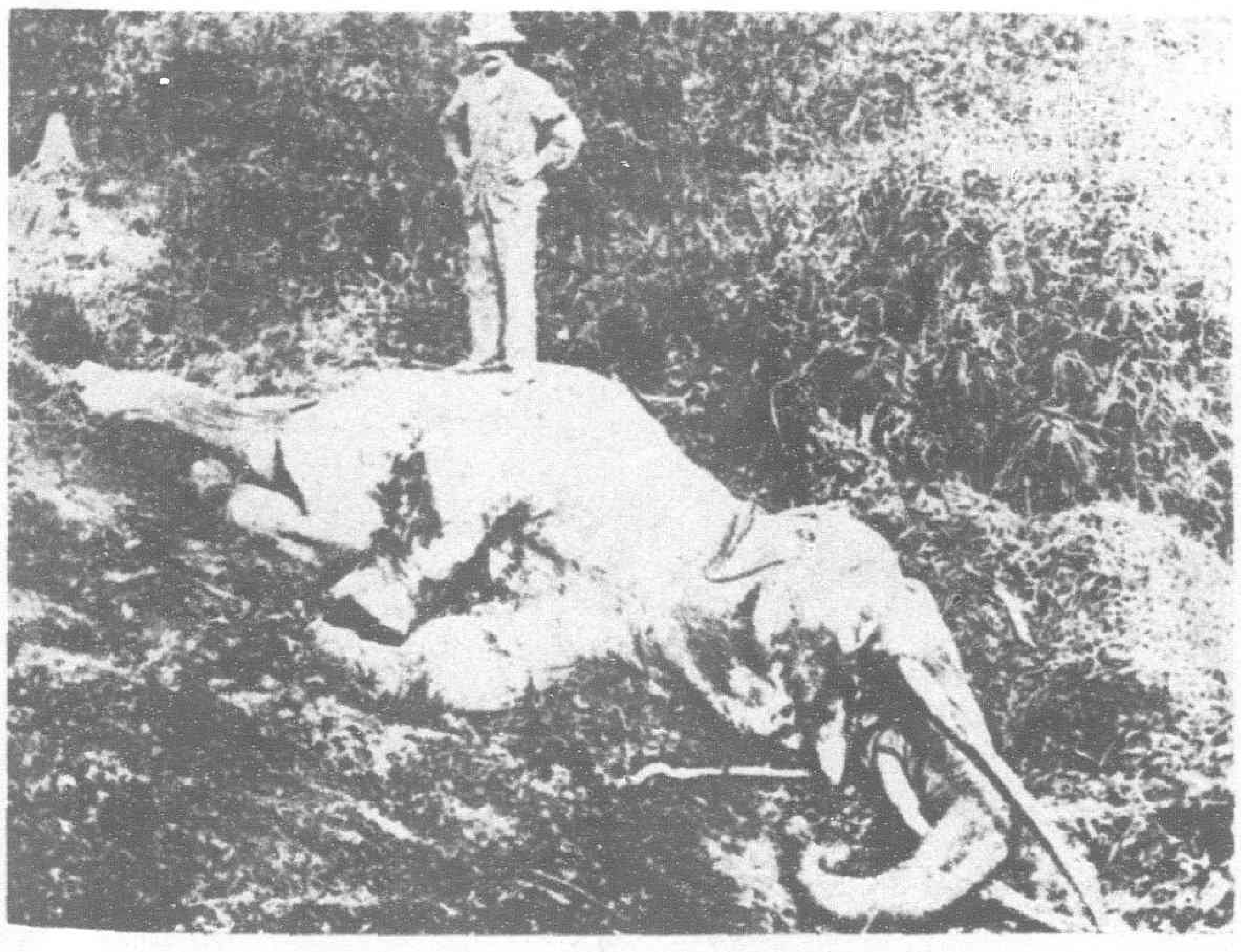
The projected railway from Kuala Lumpur to Ulu Pahang was never built, neither was the line from Klang to Kuala Sungei Dua, better known as "Deep Water Point"; this was unfortunate as it is now well known that Deep Water Point would have made a better port than Port Swettenham.

THERE IS BURIED HERE
A WILD ELEPHANT
WHO IN DEFENCE OF HIS HERD
CHARGED AND DERAILED A TRAIN
ON THE 17TH DAY OF SEPT 1894

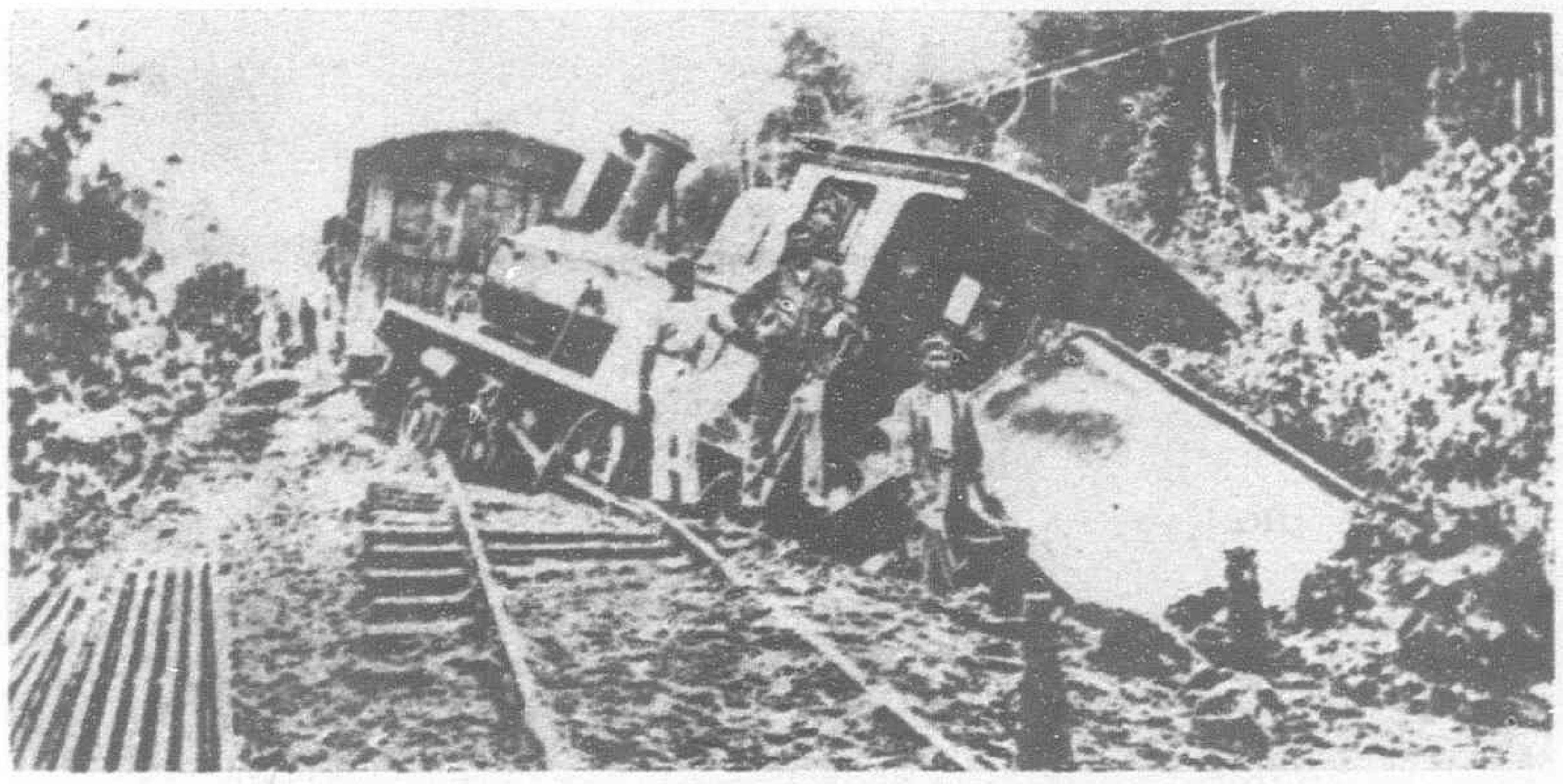
It speaks for itself

During 1892, the line from Kuala Lumpur to Pudoh was commenced and completed in 1893. This was the start on the line which eventually linked Kuala Lumpur with Singapore. This line started at Kuala Lumpur Station, ran through the present goods yard, crossed the Klang River and thence by way of Foch Avenue to Sultan Street and Pudu. It will be seen that the line wandered through the town of Kuala Lumpur and the inconvenience of the level crossings at Rodger Street, High Street, Petaling Street and Sultan Street led to the ultimate deviation of the main line in 1912 via Port Swettenham Junction and Salak South Junction to Sungei Besi.

The survey over Ginting Peras into Pahang was continued during 1892 and a line was projected from Kuala Lumpur via Sungei Besi, Cheras and Ulu Langat crossing Ginting Peras at an elevation of 1,500 feet. Descending into Jelebu the route ran through the concession of the Jelebu Mining Company to the River Triang and thence to Temerloh, a total distance of 87 miles from Kuala Lumpur.



The elephant that caused the wreck



Train derailed by collision with a wild elephant

In 1893, the extension southwards from Pudu to Sungei Besi was commenced. The objective then was Pahang via Ginting Peras with the terminus at Temerloh. As is well known this project was abandoned and the line extended southwards with Singapore as the objective.

During the year a decision was made to extend the Klang Line to Kuala Klang, now known as Port Swettenham. In this connection the Resident Engineer writes in his Annual Report:—

"The accommodation available for shipping and the depth of the water obtainable at this point had formerly been reported upon unfavorably, but after roughly sounding the proposed harbor I reported upon it as a suitable site for the construction of wharves, and with abundance of water and swinging room for vessels lying in the harbor. The question was eventually, at the Resident's request, referred by H.E. the Governor to Capt. Field, R.N. (H.M.'s Surveying Vessel *Egeria*), who carefully inspected the proposed harbor and reported most favorably upon it, and the whole scheme has now been sent to the Right Honorable the Secretary of State for the Colonies for approval."

During 1895, the line from Pudu to Sungei Besi was opened and the extension southwards to Kajang was in hand. The extension from Klang to Kuala Klang was also commenced. No new lines were opened in 1896, but the construction was in hand of the line from Klang to Kuala Klang and of the wharves at Kuala Klang. The Resident Engineer remarks, in his Annual Report, that contrary to expectation there was scarcely any sickness among the workmen. During the year the Resident Engineers of the Selangor and Perak Railways met to discuss working arrangements when the two systems joined up at the Selangor/Perak boundary.

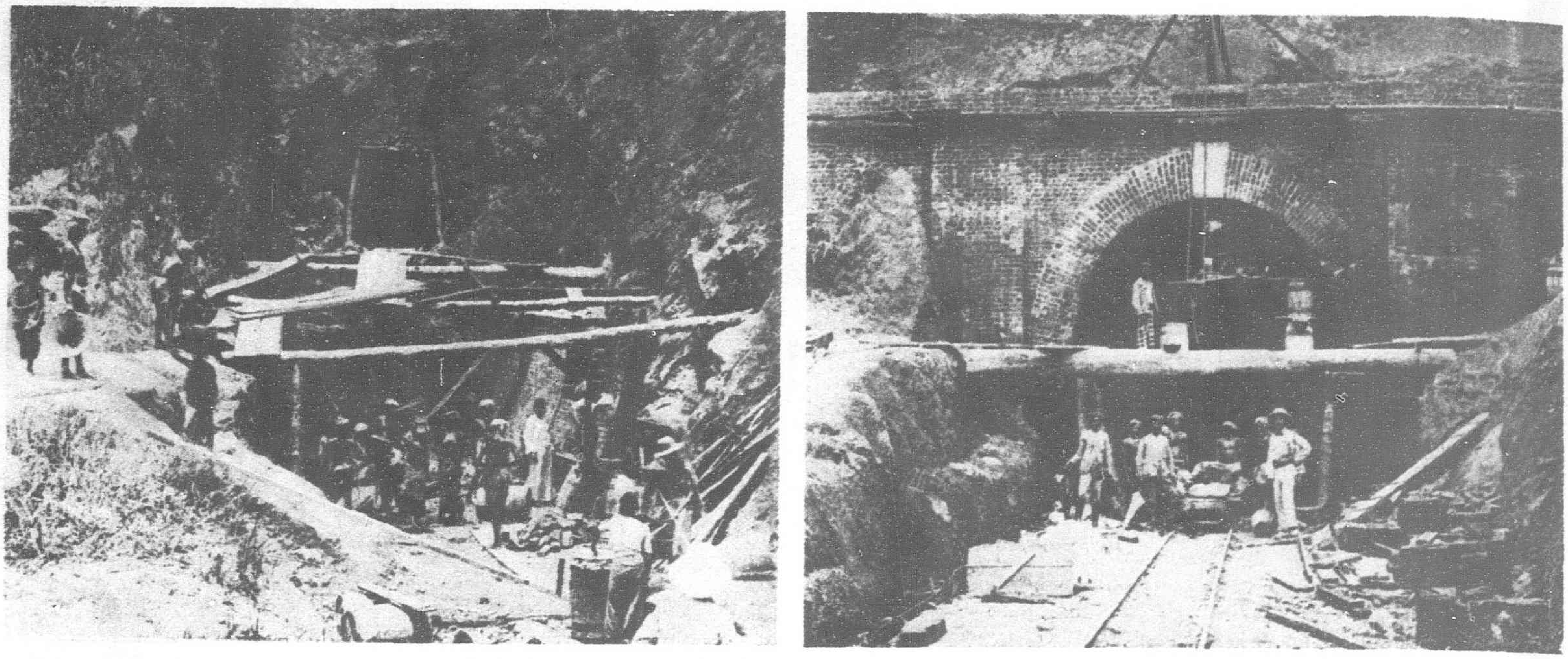
1897 saw the completion of the extensions from Sungei Besi to Kajang and from Klang to Kuala Klang although the latter line was not opened to traffic until 1899, pending the completion of the wharves. The year was notable from the fact that a scheme of Railway extension was laid down by Sir Frank Swettenham, with the approval of the Secretary of State. This scheme contemplated through connection by rail from Prai to Seremban.

During 1898 and 1899, the extension from Kuala Kubu to Tanjong Malim was in hand, and opened for traffic in 1900.

1901 saw the amalgamation of the Perak and Selangor State Railways under the style of "The Federated Malay States Railways" and administered by Mr. C. E. Spooner, C.M.G., as General Manager and Chief Engineer.

Negri Sembilan

The first railway in the State, now known as the Negri Sembilan, was opened in 1891 and ran from Port Dickson to Seremban, a distance of 24¾ miles. It was constructed and owned by a private company known as The Sungei Ujong Railway Co., which operated independently of the Government for many years, and was



Waterloo tunnel, Taiping Pass, under construction in 1899

subsequently taken over by the F.M.S. Railways system in the year 1908. No further railways were constructed in Negri Sembilan until the F.M.S. Railways were extended from Bangi to Seremban in 1903, although during 1890 and 1891, surveys were made for an extension of the Sungei Ujong Railway from Seremban to Semantan (Pahang). This project was abandoned chiefly owing to the difficult route through the mountains.

Federated Malay States Railways

It will be seen that the origin of the present system consisted of four lines linking the chief towns with the coast: thus Taiping was linked with Port Weld, Ipoh with Teluk Anson, Kuala Lumpur with Klang and Seremban with Port Dickson.

Construction continued gradually extending North and South until, in 1903, there was a through line from Prai to Seremban. A further extension Southwards from Seremban to the Johore frontier, including a branch line from Tampin to Malacca, was commenced in 1903 and opened to Malacca in 1905 and to Gemas in 1906.

During 1904, an agreement was completed with the Johore State Government for the construction of a line from the Negri Sembilan/Johore frontier to Johore Bahru opposite Singapore Island and construction was commenced in the same year. This line ran through jungle for practically the whole length and great difficulty was experienced owing to lack of communications and transport facilities over 100 of the 120 miles the line was to cover. Except in the vicinity of Johore Bahru itself, roads did not exist and except for the Muar River at Buloh Kasap, no navigable river was crossed.

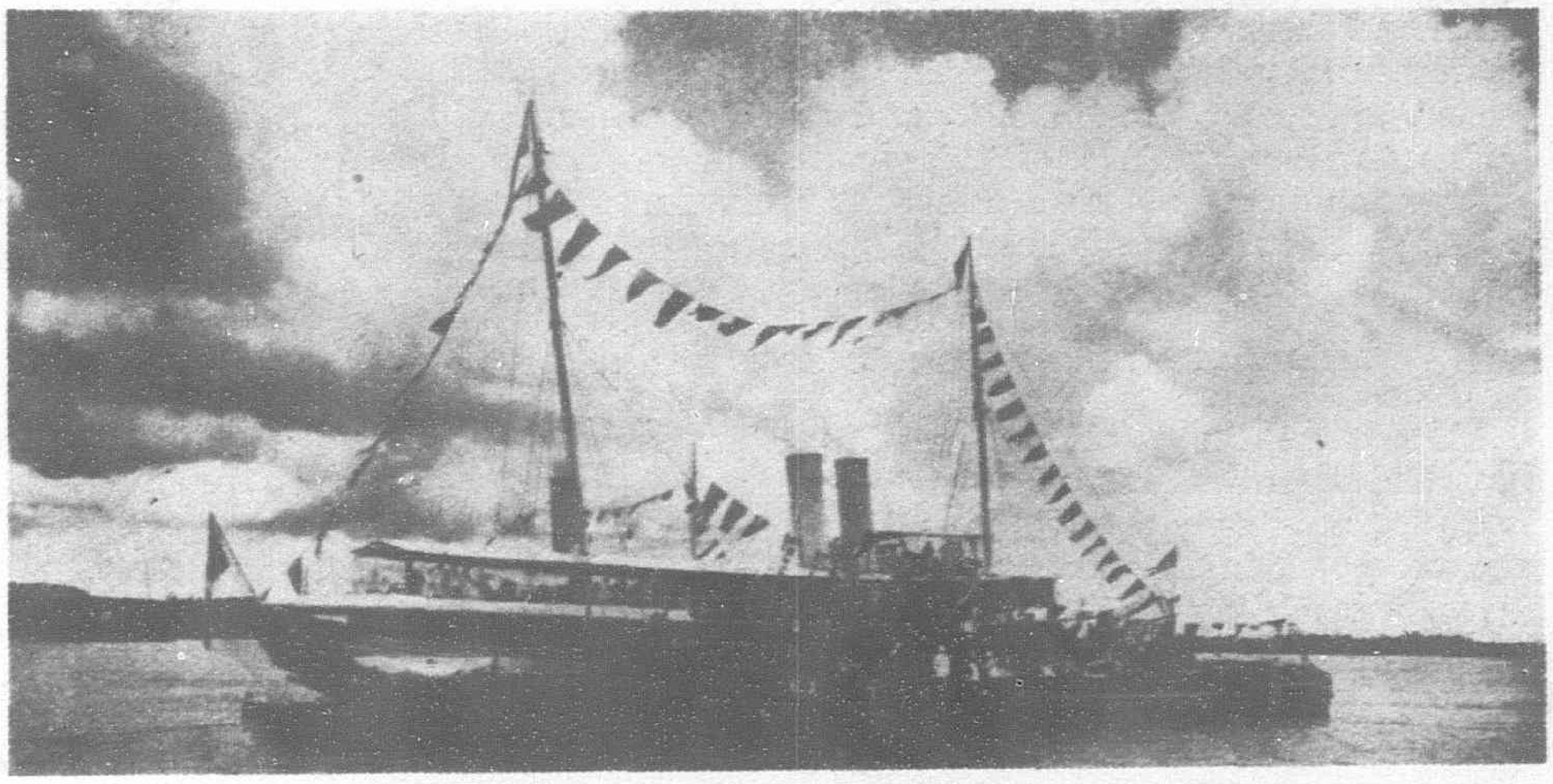
On July 1, 1909, the line through Johore was opened and through communication was thereby established from Penang in the north to Johore Bahru; from there a ferry conveyed passengers across the Johore Straits to Woodlands where they joined the Singapore—Kranji Railway for Singapore. In 1910, a goods wagon ferry was opened between Johore Bahru and Woodlands thus avoiding transhipment of goods.

The Singapore—Kranji Railway constructed by the Colonial Government in 1903, was purchased by the F.M.S. Railways in 1913.

The construction of the Causeway across the Johore Straits to carry two tracks of railway and a 26 foot roadway was commenced towards the end of 1919. The Causeway was opened for goods trains on September 17, 1923, and for passenger trains on October 1, 1923, the ceremonial opening being performed by H.E. the Governor and High Commissioner, Sir Laurence Guillemard, K.C.B., K.C.M.G., on June 28, 1924. The length of the Causeway is 3,465 feet and the average depth of water in which it is laid is 47 feet at low tide

Kuala Lumpur yard and station in 1890

with a maximum depth, also at low tide, of 77 feet. It is constructed entirely of granite block, over 1½ million cubic yards being used. A lock 510 feet long, 32 feet wide and 10 feet deep, at low tide, has been constructed through the Causeway at the Johore end for small local craft. A rolling lift bridge, the only one of its type in this part of the world, carries the railway and roadway across the lock. The bridge is 57 feet wide and the weight of the moving part is 570 tons. It is operated electrically, as also are the lock gates.



The ceremony of laying the foundation stone of the Johore Causeway in 1919

The East Coast Railway

The East Coast Railway leaves the main line at Gemas and runs in a northerly direction via Kuala Lipis to Tumpat in Kelantan, a distance of 327¾ miles.

Reference has previously been made to the projected lines from Kuala Lumpur and from Seremban into Pahang, both had the same objective, i.e. Temerloh or Kuala Semantan. The objective of the East Coast Railway was also originally Temerloh and it was then known as the Gemas—Kuala Semantan Railway. It may be wondered why Temerloh, a Kampong on the Pahang River, should have been made the objective. Temerloh is almost on a direct line between Kuala Lumpur or Seremban and Kuantan on the East Coast and in the early days of the railway the engineers and administrators had in view an ultimate extension to Kuantan.

When construction had been in hand some time it was decided to run the line through Pahang and Kelantan to Tumpat and the original survey to Kuala Semantan was deviated at Mengkarak and now crosses the Semantan River at Mentakab, about seven miles from the *Kuala*. Construction from Gemas end was commenced late in 1907, and the first section from Gemas to Bahau including a branch to Kuala Pilah was opened in April, 1910. Further extensions were opened from time to time until, in 1913, Tembeling 117 miles from Gemas was reached. Meanwhile, in 1912, construction commenced at Tumpat working south and a section from Tumpat to Tanah Merah, a distance of 32 miles was opened in 1914, and in the following year a small branch was opened from Tanah Merah to Riverside on the Kelantan River.

During the Great War construction slowed down considerably on the south section and was suspended in Kelantan. In 1917, the line from Tembeling to Kuala Lipis was opened to traffic, thus linking up the Administrative Capital of Pahang with the Railway system.

Construction in Kelantan recommenced during 1918, work being at first concentrated on a branch from Pasir Mas to Sungei Golok on the Kelantan/Siam frontier to join up with the Siamese Railways. This branch, 11½ miles long, was opened on September 1, 1920, thus giving Kelantan rail communication with the rest of the Peninsula via the Siamese Railways to Padang Besar.

During 1920, work commenced on the bridge over the Kelantan River near Tanah Merah. This is the longest bridge in the Peninsula and consists of five spans of 250 feet each and five spans of 150 feet each. Work on this bridge and on construction generally, was slowed down during the slump period of 1921/22. The Kelantan Bridge was completed in November, 1923, and opened for traffic in 1924. The official opening was performed by H.E. Sir Laurence Guillemard, and the bridge was named " The Guillemard Bridge." The line from Tanah Merah to Krai was also opened in 1924. Meanwhile, construction was proceeding from the south and the line to Merapoh, the boundary between Pahang and Kelantan, was opened in 1927 and in the same year a further section from Krai to Manek Urai. The line from Manek Urai to Merapoh is very heavy and owing to difficulties in transport, progress was necessarily slow. The highest known flood which occurred in December, 1926, caused a great deal of damage to the construction works and rendered necessary a considerable deviation in the original line between Kuala Gris and Kuala Pergau, necessitating heavier tunnelling and additional expenditure. There are nine tunnels on the East Coast Railway of which eight are in Kelantan, they vary in length from 309 to 2,340 feet, the total length being 7,704 feet. The East Coast Railway was completed on September 5, 1931, the ceremonial opening being performed jointly by H.E. Sir Cecil Clementi and H.H. the Sultan of Kelantan.

The Kedah Railway

The Kedah line branches off from the main trunk line at Bukit Mertajam, seven miles south of Prai, and runs through Province Wellesley, Kedah and Perlis to the Siamese boundary at Padang Besar where it joins up with the Siamese Railway System. The length of the line is 99 miles.

Construction of the line was commenced in 1912, which was opened to Alor Star, the capital of Kedah in 1915 and to Padang Besar in 1918.

Tronoh Branch

This branch runs from Ipoh to Tronoh, a distance of fifteen miles, with stations at Menglembu, Lahat Town, Papan, Pusing and Siputeh. It taps a very populous mining area. Construction of this line started in April, 1907, and it was opened to traffic in October, 1908.

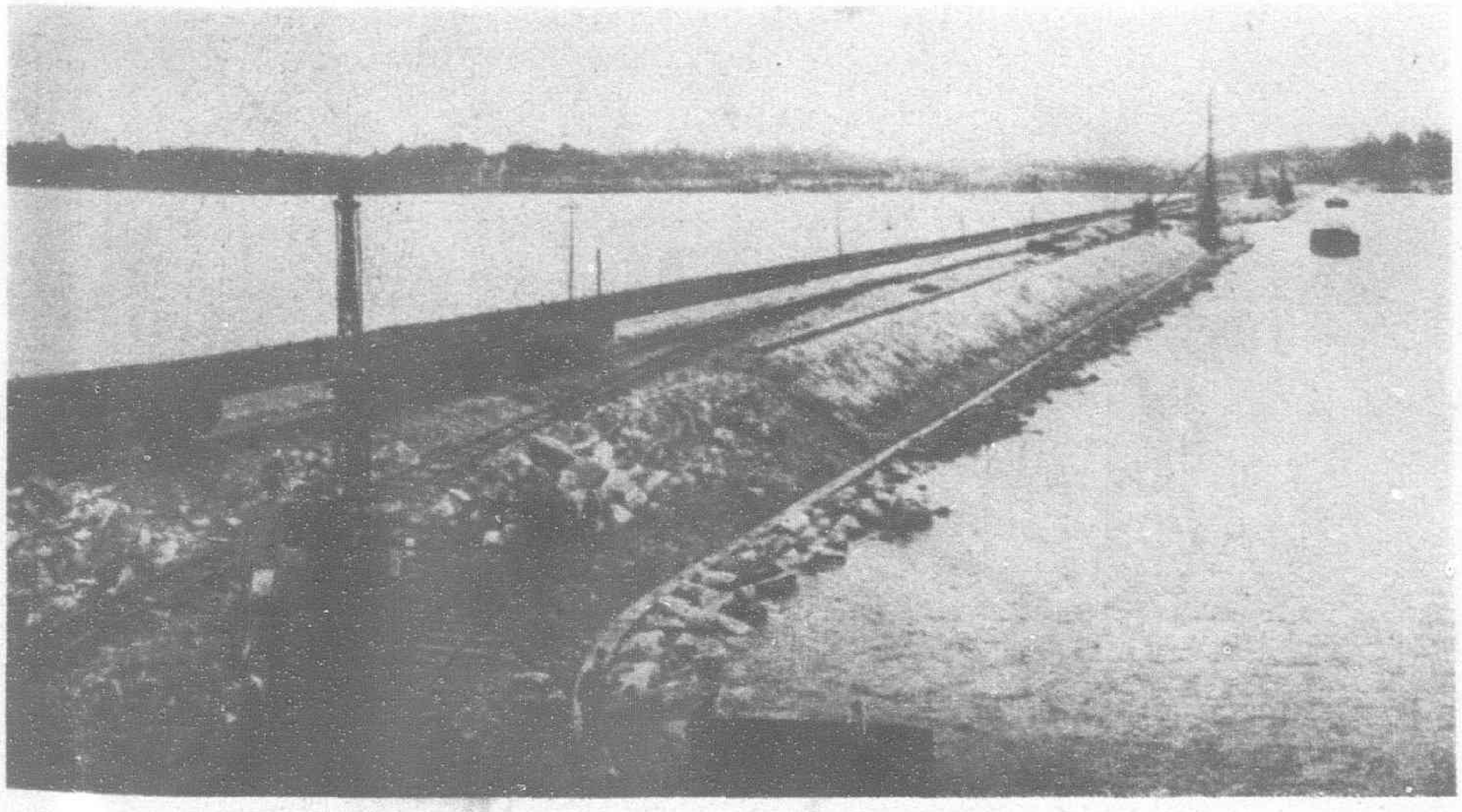
Batang Berjuntai Branch

The branch starts at Kuang on the main line fifteen miles north of Kuala Lumpur and runs to Batang Berjuntai, a distance of fourteen miles, with stations at Pengkalan Kundang, Batu Arang and Bukit Badong. Construction was commenced in November, 1913, and completed to Batu Arang in July, 1915. Work beyond Batu Arang was suspended for a while; but subsequently re-started and the line to Batang Berjuntai opened to traffic in February, 1918.

This branch connects with the Malayan Collieries at Batu Arang.

Kuala Selangor Branch

This branch ran from Connaught Bridge Junction on the west of the Klang River to Klang



Johore Causeway. East side of causeway showing full width.

North and thence via Vallambrosa and Jeram to Kuala Selangor, a distance of 32 miles. Construction started in 1911 and the line was opened to Assam Jawa in 1913 and to Kuala Selangor in 1914. Owing to the earnings of this branch not covering working expenses on account of road competition, the line was closed down in 1931 and was dismantled in 1934.

Ampang and Sultan Street Branches

The branch from Sultan Street, Kuala Lumpur, to Salak South Junction, 4½ miles long, was originally the main line from Kuala Lumpur to Sultan Street, Pudu and Sungei Besi. After the deviation of the main line via Port Swettenham Junction and Salak South, the portion of the old main line from Kuala Lumpur to Sultan Street was removed and the remaining line from Sultan Street to Salak South Junction became a branch line.

The Ampang line branches off from the Sultan Street branch and runs to Ampang Village, a distance of 4¼ miles from the junction.

Batu Caves Branch

The Batu Caves Branch, 5¼ miles long, was opened in 1905. It serves the Central Workshops and the Railway township at Sentul and important quarries and other works at Batu Caves. During *Thaipusam* (Hindu Festival) it is extensively used by pilgrims and sightseers to Batu Caves.

Penang Hill Railway

The first Penang Hill Railway, built by private enterprise, was a failure. The present railway was constructed by the F.M.S. Railways; it was commenced in 1920 and opened in 1923. From January 1, 1924, it was handed over to the Colonial Government which now owns and operates it. The Penang Hill Railway is a Cable Railway, the motive power being electricity; its total length is 1¼ miles, the steepest gradient being 1 in 1.95. Near the top there is a tunnel 258 feet long on a gradient of 1 in 2.04. The upper station is 2,400 feet above sea level.

Naval Base Railway

The Naval Base Railway which provides railway connection to H.M. Naval Base, Singapore, commences at Kranji and proceeds to the Naval Base, a distance of about five miles. It was constructed by the F.M.S. Railways for the Admiralty.

Changi Railway

A railway about four miles in length of 4-ft. 8½-in. gauge was constructed by the F.M.S. Railways for the War Department near Changi in connection with the Singapore Defences.

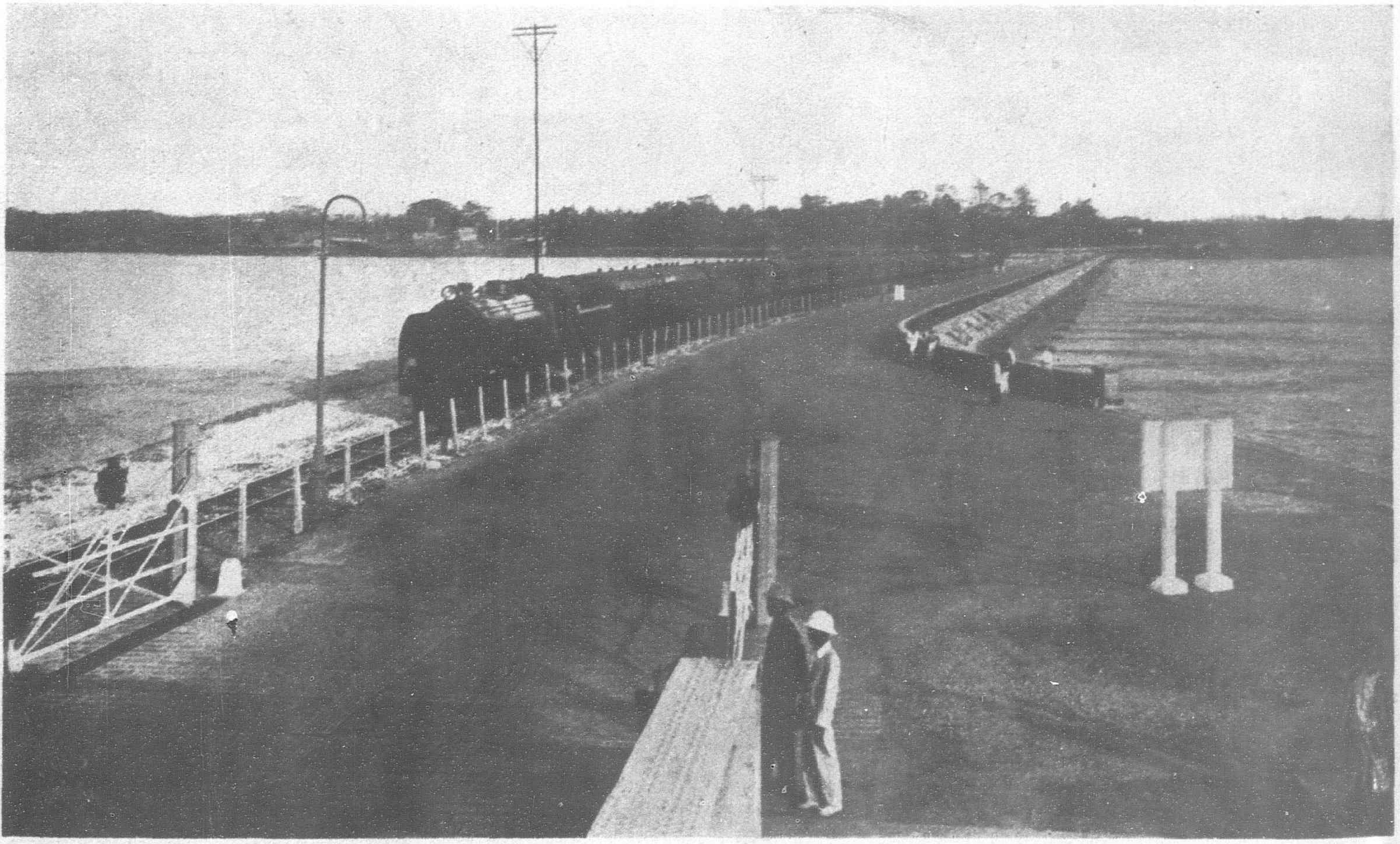
Surveys of Projected Lines

Numerous reconnaissance and preliminary surveys of projected lines have been made in various parts of the country. As has already been stated, in the early 'nineties, surveys were made from Kuala Lumpur and Seremban over the range of mountains into Pahang. Recently in 1931 further surveys were made for a projected East to West Railway from Kuala Lumpur to Kuantan, Pahang, and it was ascertained that the route via Ginting Peras was the most suitable though steep grades, sharp curves and much tunnelling would be necessary. A survey was made for a rack railway from Merapoh on the East Coast Line near the Pahang/Kelantan boundary to Gunong Tahan rising to about 7,000 feet above sea level. Surveys were also made from Kampar and Batu Gajah in Perak to Kuala Lipis in Pahang via the Cameron Highlands. Of the other surveys, the principal one was for another projected East Coast Line from Johore to Kelantan keeping near the Coast and traversing Pahang and Trengganu.

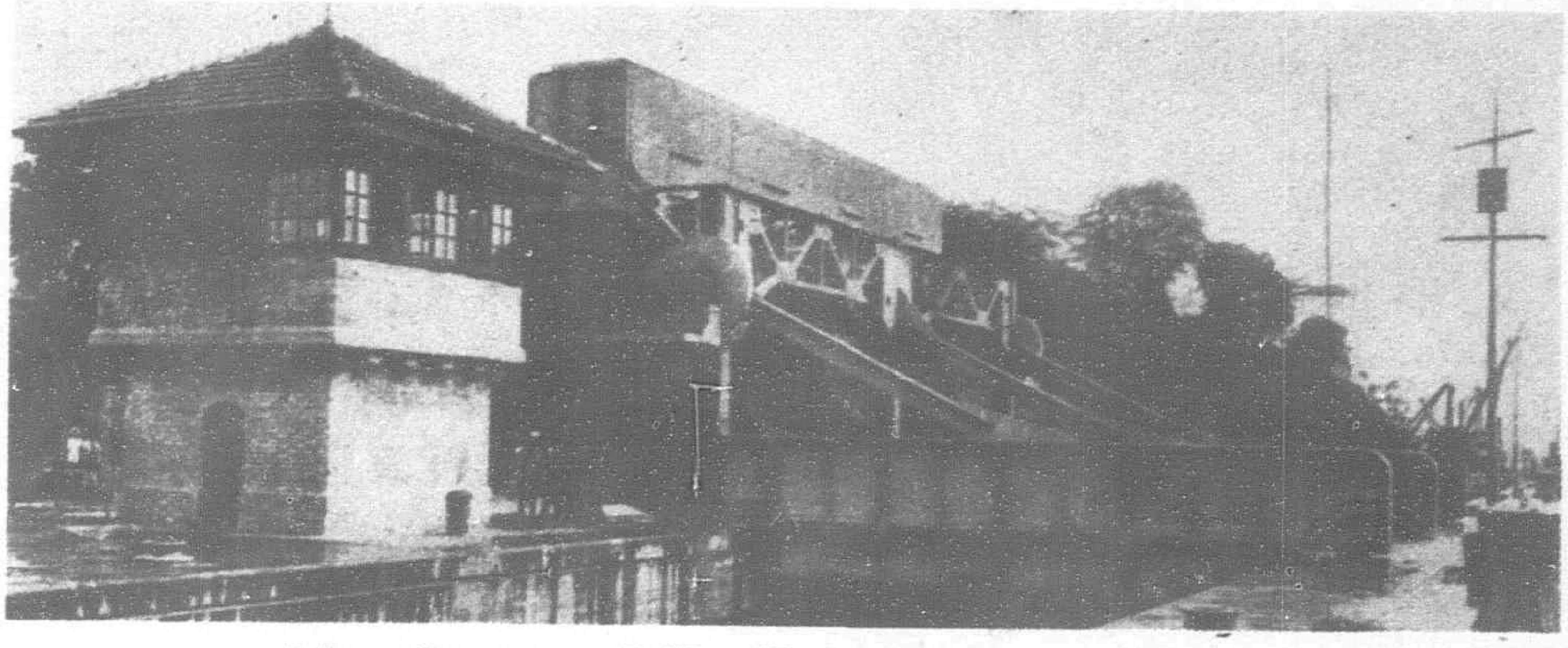
Deviations

During the history of the railway several deviations of the existing line were carried out for various reasons. The principal ones were as follows:—

Serdang Deviation between Sungei Besi and Kajang to avoid excessive curvature and improve the alignment carried out in 1907.



Mail train crossing over Johore Causeway approaching Johore Bahru



Johore Causeway. Rolling lift bridge and operating cabin

Main Line Deviation from Kuala Lumpur to Salak South Junction to avoid the route through the town between Kuala Lumpur and Sultan Street completed in 1912.

In 1915, the first Kuala Kubu Deviation was constructed to avoid the silting of the Selangor River. The silting, however, continued so rapidly that it was soon necessary to make a second deviation; this starts at Kuala Kubu Road and ends at Rasa and avoids Kuala Kubu altogether. It was opened in 1924.

Kamunting Deviation. This deviation, about three miles in length, is between Taiping and Ulu Sapetang and was constructed in 1929, largely at the expense of a Tin Dredging Company.

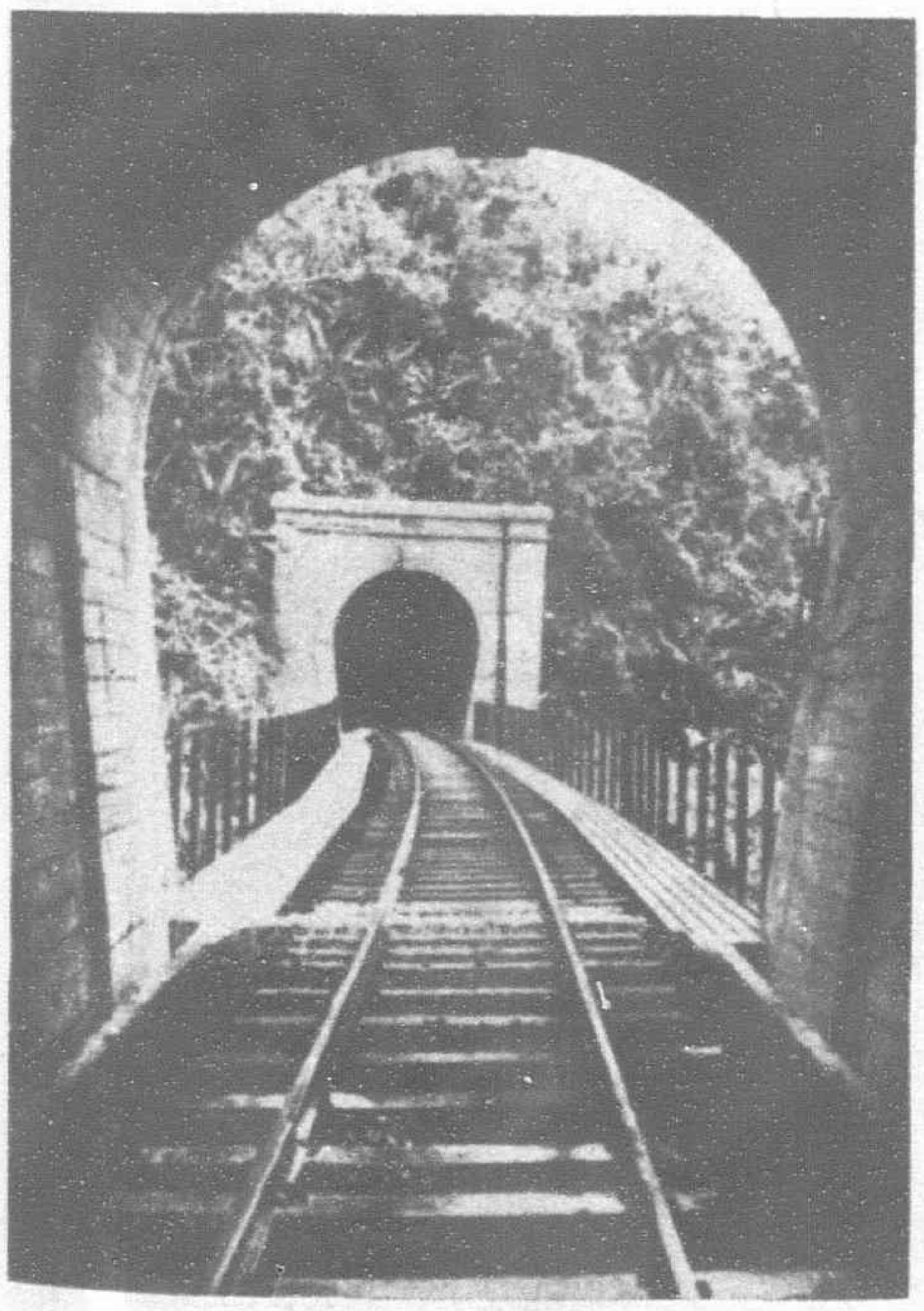
The Singapore Deviation is the most important one constructed by the F.M.S. Railways. In 1920, it was proposed to double the line from Woodlands to Tank Road and build a new terminal station and hotel at the foot of Fort Canning. Work was actually commenced on the doubling of the line; but was stopped during the 1921 slump. Later, the scheme was abandoned, and a decision made to deviate the line from a point between Bukit Panjang and Bukit Timah to Tanjong Pagar with a terminal station at the latter place and intermediate stations at Bukit Timah, Tanglin and Alexandra Road. This deviation, 8½ miles in length, avoids the old route through Singapore and skirts the western boundary of the town. It was opened to traffic in May, 1932.

Doubling of Line

The line was doubled between Prai and Bukit Mertajam, in 1917, in order to cope with the increased traffic to Kedah and Siam consequent on the opening of through traffic with Bangkok. In 1924 and 1925, the line was doubled between Kuala Lumpur and Batu Junction and Kuala Lumpur and Sungei Besi for suburban traffic.

Floods and Washouts

A railway in the tropics with a high average rainfall is always subject to damage by floods, and the F.M.S. Railways have been no exception. From the earliest days of the railway there have been interruptions to traffic during the wet season due to floods, slips and subsidences. Remedial measures so as to consolidate embankments and cutting slopes have been carried out extensively and at heavy cost and although the railway can never become immune, the track has been so improved that serious interruptions to traffic during normal wet weather are not likely to occur.



Tunnel Nos. 3 and 4 with bridge in between, situated between Kuala Gris and Kuala Pergau—East Coast Line

The earliest high flood recorded occurred in December, 1897, when the flood level of the Perak River rose 30 feet above normal at the Enggor bridge site. This resulted in the proposed level of the bridge being raised by six feet which made rail level 11 feet higher than the flood level. In December, 1898, there was another flood of the Perak River and although the flood level was lower than the previous year, much damage was done to the temporary work in connection with the construction of the bridge.

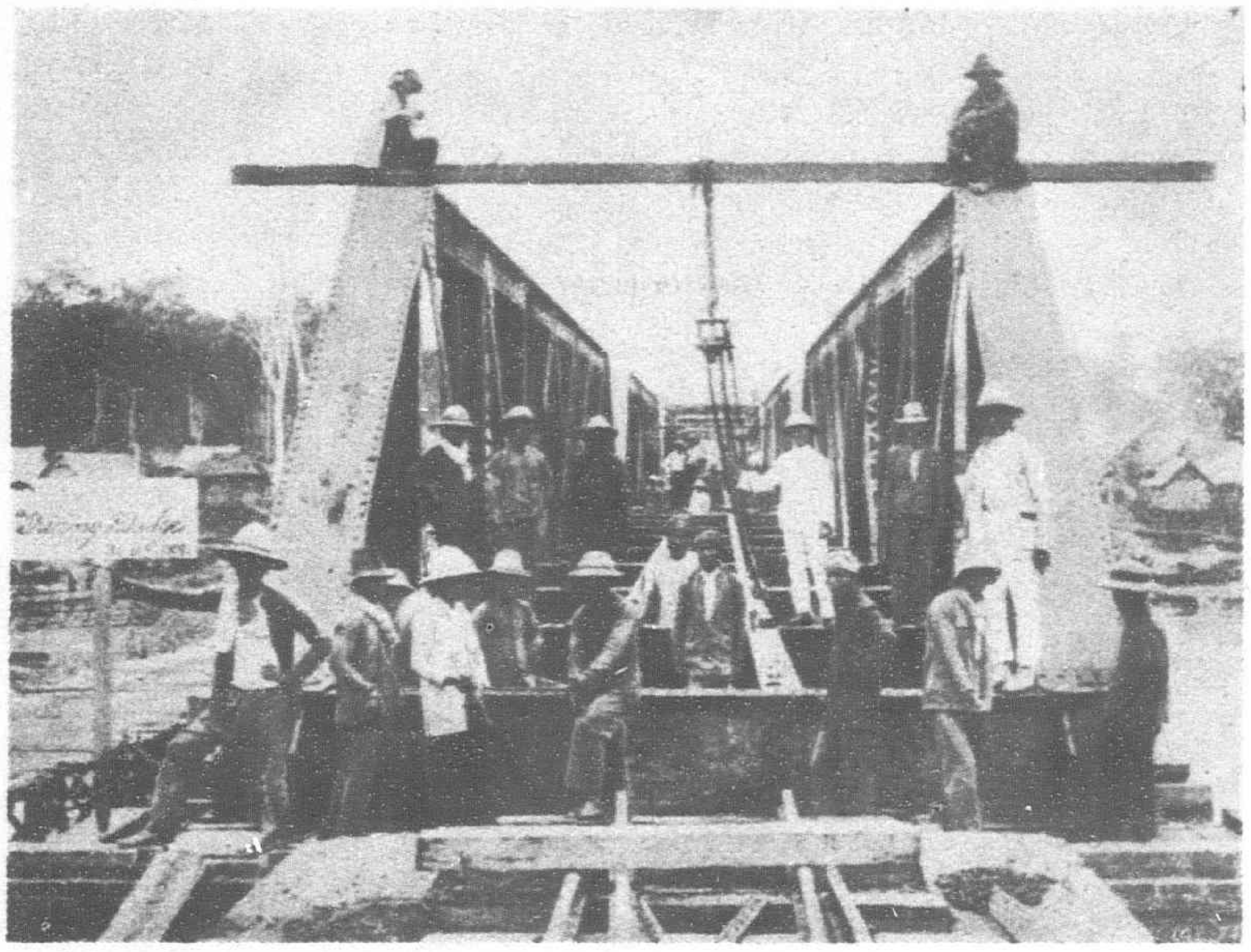
The flood of December, 1926, was the highest ever recorded and was general throughout the Peninsula. Very extensive damage was caused by this flood not only to lines open for traffic but also to lines under construction in Pahang and Kelantan. At Enggor, the flood rose 7-ft. 6-in. higher than the 1897 flood and to within 9-in. of the girders of the bridge. At Kuala Kangsar, there was seven feet of water over the rails. In Province Wellesley on the Kedah line, a bridge was washed away on the night of December 31, and a goods train from Padang Besar to Prai was precipitated into the water below. Unfortunately the driver and two firemen lost their lives. Most of the damage, however, occurred in Pahang and Kelantan. At Mentri, near the 60th mile, the water rose 62 feet above normal level and 20 feet over the rails. At Kuala Krau there was a similar rise in the river level. Most of the population of the place, including two Europeans, was marooned for several days on a small hill opposite the Railway Station. At Krambit where there was also twenty feet of water over the rails, a passenger train, overtaken by the flood, was completely submerged. Fortunately there was no loss of life here. At Kuala Lipis there was seven feet of water over the line at the Railway Station. At Kemubu, the river rose 67½ feet above normal and 25 feet above rail level. At Kuala Krai, the rise was 72 feet above normal and fifteen feet above rail level. At Manek Urai, where the line crosses the Lebir River, two steel spans of 250-ft. each weighing 807 tons were washed away by the flood which rose to 22 feet above rail level. The branch line from Pasir Mas to Sungei Golok, connecting with the Siamese Railways, was almost completely destroyed. In Kelantan, one European and seventeen workmen employed on railway construction lost their lives during this flood.

In December, 1931, there was another disastrous flood in Pahang and Kelantan, although on this occasion flood level was generally ten to fifteen feet below the record flood of 1926. As a result of this flood, through communication with Kelantan via the East Coast Railway which had only been opened since September, 1931, had to be closed down for several months. The principal damage was the destruction of the Peel Bridge at Kemubu, two steel spans, each 250 feet, were washed away. Extensive damage was also caused to banks and cuttings between Triang and Pasir Mas.

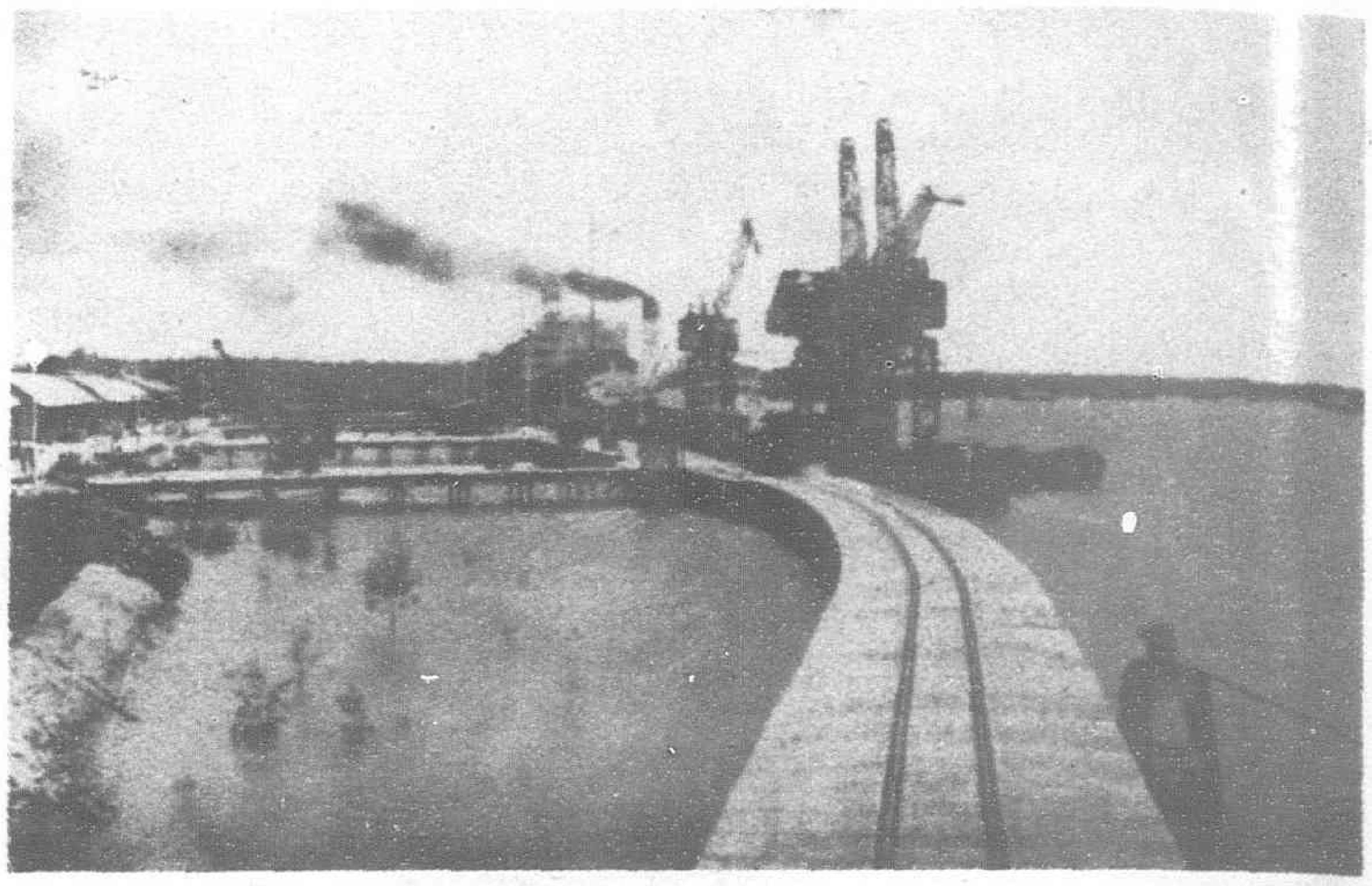
Station name board, six languages, Padang Besar, junction of F.M.S. and Siamese railways

Wharves

The F.M.S. Railways have built, own and operate the wharves at the various ports of the Peninsula (except Singapore), served by the Railway.



Erecting steelwork—Triang bridge

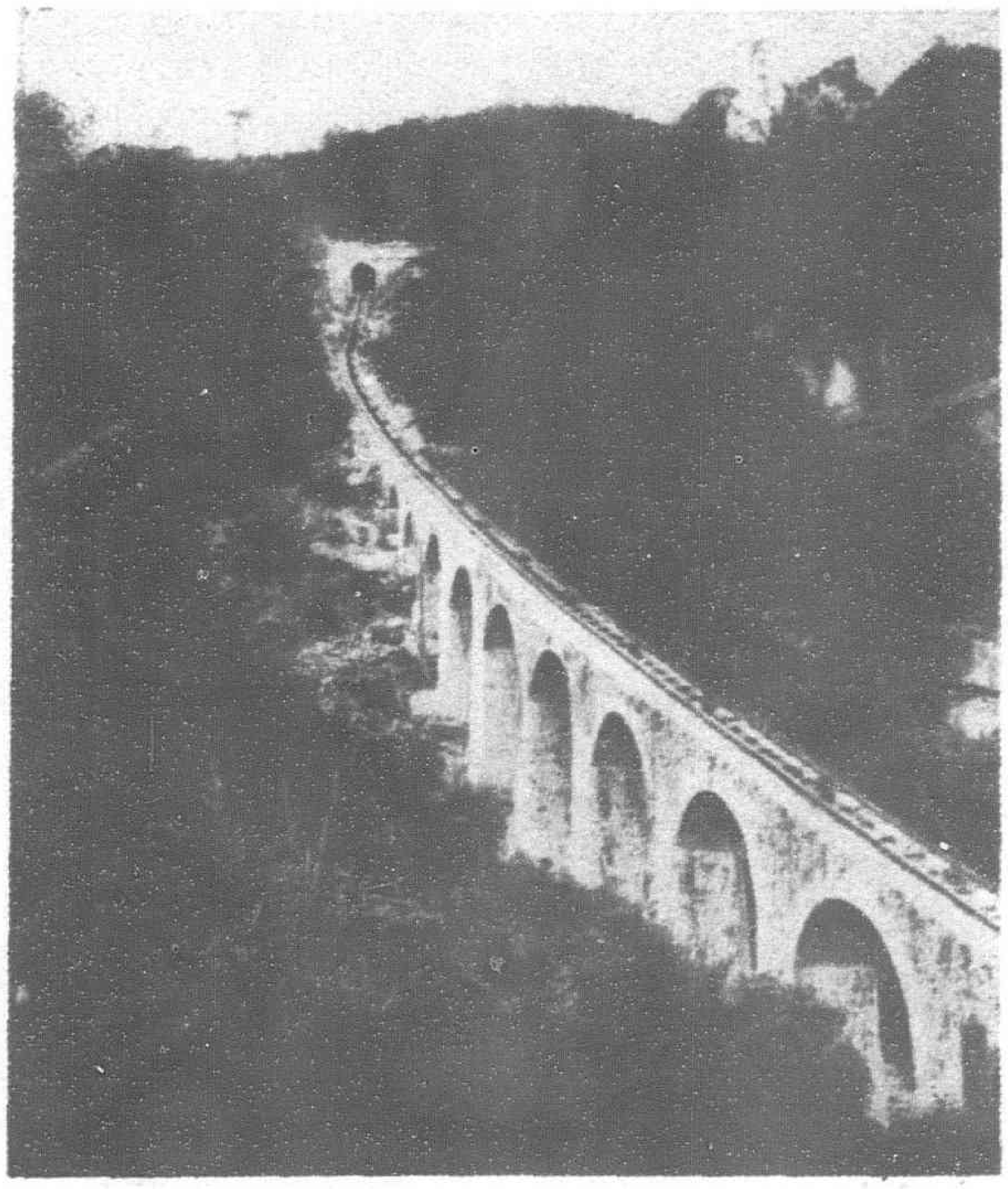


No. 6 Wharf, Port Swettenham with two steamers alongside and cranes working lighters

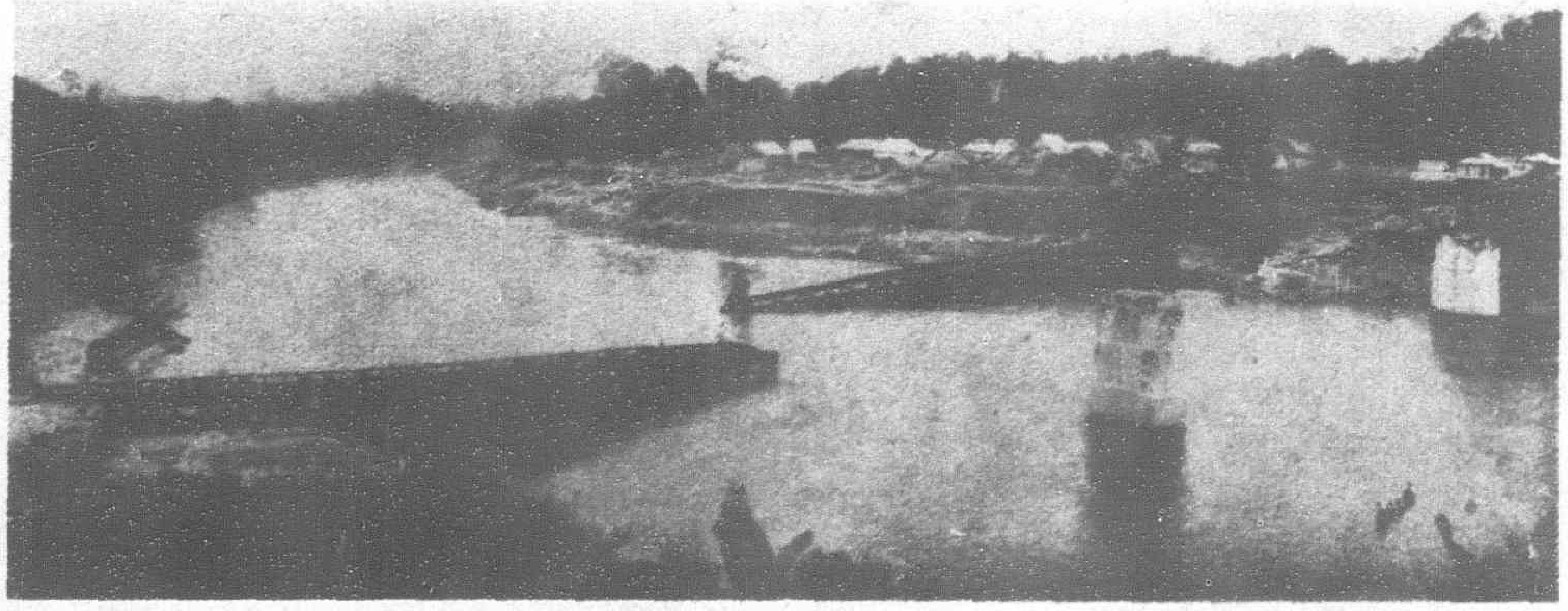
Port Weld.—The first wharves to be constructed were at Port Weld. These consisted of a timber structure near the station for local steamers and smaller jetties for firewood traffic. In 1929, the main wharf was rebuilt in reinforced concrete.

Teluk Anson.—The first wharves at Teluk Anson were built in 1893, alongside the river at Teluk Anson Town. The new wharves lower down the river were opened in 1909. These consist of two pontoon wharves for local steamers.

Klang.—When the line was opened to Bukit Kuda in 1886, temporary wharves were constructed there on the bank of the Klang River. In 1890, when Klang Station was opened, new wharves were built on the adjacent river bank; there were three of these, one timber and two pontoon wharves. Owing, however, to the swift current, it was found very difficult to maintain the pontoon wharves, which were abandoned and replaced by timber structures.



Penang hill railway—lower section



Peel bridge at Kemubu, East Coast Line, destroyed by flood, December, 1931

Port Swettenham.—On the opening of the line from Klang to Port Swettenham in 1900, the first permanent wharves were built. In that year, three wharves and a passenger jetty were completed. The wharves, each with about 100 feet of frontage, were for use by local steamers. They were founded on cast iron cylinders six feet diameter, sunk to a depth of 70 feet below mud level. The superstructure is of steel and the deck of timber. The passenger jetty is a screw pile structure with a timber deck and timber and corrugated iron cover. It is situated near the station and is intended for the use of passengers to and from ocean-going steamers anchored in the roads. In 1910, a pontoon wharf was opened for tongkang traffic and another wharf also for the use of tongkangs was constructed of hardwood timber in 1912. The main wharf for ocean-going steamers was completed in 1914. It is constructed of steel screw piles sunk to a depth of about forty feet below mud level. The superstructure is of steel and the original timber deck has recently been replaced by reinforced concrete. The wharf is 1,010 feet long and fifty feet wide, it has rail access and powerful electric cranes for working cargo.

Port Dickson.—In 1892, the Sungei Ujong Railway Co., constructed a steel screw pile wharf at Port Dickson. This was taken over with the Sungei Ujong Railway in 1908 and operated by the F.M.S. Railways until 1926, when it was reconstructed.

Tumpat.—In 1912, a timber jetty was constructed at Tumpat mainly for the discharge of railway material for the construction of the line from Tumpat southwards. It has, however, been kept going for general cargo. Owing to the shallow water inside the bar at Tumpat, the depth of water at the wharf is only about 2-ft. 6-in. at low tide. Steamers anchor outside the bar and cargo is brought to and from the wharf in special shallow draught lighters.

Kota Bharu and Palekbang.—The Kelantan River separates the town of Kota Bharu, the Capital of the State of Kelantan, from the railway at Palekbang. A ferry service is maintained between the two and for this purpose pontoon jetties were constructed in 1914, at Palekbang and at Kota Bharu. In addition a small timber wharf for goods traffic was provided at Palekbang.

Prai.—In 1899, when the line was opened to Prai, a passenger pontoon jetty was constructed on the river bank opposite the station for use of the railway passenger ferries between Penang and Prai. Two timber jetties for general merchandise were also built. In 1914, the Railway Department took over from the Prye Dock Co., a screw pile wharf which accommodated small ocean-going steamers and was chiefly used for coal traffic. In 1916, this wharf was demolished to make room for the present wharves which were commenced in 1916, and completed in 1923. The wharves consist of a main wharf for ocean-going steamers 1,100 feet long by 142 feet wide, constructed entirely of reinforced concrete and founded on concrete cylinders sunk to a hard foundation about forty feet below mud level. The landward side of this wharf was dredged to form a basin for lighters. In addition there is another 1,000 feet of wharf frontage of solid block construction. As is well known the rapid silting at the mouth of Prai River has prevented full use being made of these wharves.

Penang.—The railway jetty at Penang was constructed in 1901, for the use of the ferry steamers. At the landward end it is carried on brick piers for a distance of 114 feet from the quay wall. This portion being 45 feet wide originally accommodated the station master's and booking offices now situated in the main building at the corner of China Street Ghaut and Weld Quay. The jetty then narrows to 16 feet for a length of 400 feet with a Tee head 96 feet by 30 feet at the seaward end. This portion is on screw piles with a timber deck and corrugated iron roof.

Prai wharf under construction

Japan's Offer to Guarantee American Possession of the Philippines

(Continued from page 154)

"informally and in the strictest confidence, the following views regarding the situation in the Philippine Islands:

> [14] "The Imperial Government are without territorial ambition in the direction of the Philippine Islands. . . The Imperial Government, being fully alive to the dangers, following from an unsettled state of things in those Islands and in view of the interests springing from propinquity, would be willing to join with the United States, either singly or in conjunction with another Power having identical interests, in the endeavor to form, subject to proper conditions, a suitable government for the territory in question under the joint or tripartite protection of the guaranteeing Powers."

Finally, on September 16, 1898, the American Minister to Japan wrote to the acting Secretary of State. His dispatch was also headed, "Confidential—not to be given to the press," and read as follows:

> [15] "I have the honor to inform you further that yesterday, in an interview which I had with Count Okuma, Minister President of State and for Foreign Affairs, he expressed the strong desire on the part of Japan that, in the interests of peace, commerce, and good government, the United States should hold and govern those islands. . . . . Count Okuma also states, in substance, that, in event it should be determined finally by our Government not to retain the islands—considering their proximity to the territory of Japan and the interests in commerce and the peace of the East which she has in common with the United States and Great Britain—in the solution of the question of their future government, he indulged the hope that the immediate concern of Japan would not be overlooked; saying that he would be highly gratified and his country would be honored to be associated with the United States in the interest of good government in the East, as well as in the interests of commerce and peace."

We answered this generous offer of co-operation even to the point of war by annexation of the islands. Pure and simple annexation. . . . as we had done in Hawaii! Now, almost half-a-century after the event, we have decided to grant the Filipinos full independence. What will this mean in the new balance of power in the Far East? Will they be greedily gobbled up by Japan, as the Filipinos seem to fear? We once ignored Japan's offer to fight to guarantee our possession of the Islands; with the other hand, we drank fully from the cup of England's friendliness. Would Japan's policy be changed to-day, in view of our subsequent and unremitting opposition to her expansion? Speculation is idle, but I submit that the Anglo-American understanding of the 20th century might well and profitably have been supplemented and reinforced by a similar understanding with our one natural ally in Asia—Japan. Such an agreement was effected once, under the far sighted leadership of Theodore Roosevelt, but the insidious propaganda of sectional interests, coupled with profound ignorance on the part of the masses of our people, destroyed it. Traditional Japanese friendship has been sacrificed on the altar of selfish, ignorant politicians, and inept diplomacy.

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[14] *Diplomatic Correspondence* (in Mss) Department of State.
[15] *Diplomatic Correspondence* (in Mss) Department of State.

New Nanking Administrative Center

Measures for the establishment of the Administrative Center in the capital have been devised jointly by the Nanking Ministries of Interior, Finance, and War. Two thousand mow of land are to be purchased in the vicinity of the Ming Palace, and $800,000 have been appropriated for the purchase. The offices of the Central Party Headquarters are to be on the north side of Chungshan Road and the National Government on the south side. The offices of the Legislative, Judicial, Examination, and Control Yuans will be in a semi-circle behind the National Government building. The various ministries, committees, and commissions under each of the four yuans are to be located on both sides of the respective yuan buildings. The building for the Executive Yuan is to stand in front of that of the National Government. The offices of the various ministries, committees and commissions under the Executive Yuan will be clustered around it.

Bolgoda Bridge, 5th Mile, Panadura—Nambapana Road

By S. MAHADEVA, ASSOC.M.INST.C.E., M.INST.W.E., F.I.S.E., M.R.SAN.I., Public Works Department, Ceylon

METAL bridges date from the time of the industrial revolution in England and have been in common use only during the past 160 years. In the days when the metallurgy of iron was little known, cast iron was popular and the compressive factor was taken advantage of. The first metal bridge was an arch of cast iron constructed in the year 1775 at Colebrook Dale over the Severn, with a span of 100 feet, roadway 26 feet and rise of versine 45 feet.

About five years later, the heavy cast iron beam bridges came into use with narrow compression and broad tension flanges complete with stiffeners and all cast together.

Wrought iron beams were produced in 1832, but the construction of wrought iron lattice bridges did not commence until 1853.

The industrial activity and the developments in machinery led to the production of heavy plates in mills, and 1857 saw the first plate girder bridges. When plate girders of wrought iron had become possible the field of metallurgy extended to the production of mild steel.

Improvement of material alone, however, did not result in the development of structures. Designers had to formulate stress diagrams and evolve suitable frames with struts and ties in various planes to produce equilibrium. That was successfully done before long; but the problem of fabrication and construction remained insurmountable until some famous contractors by virtue of their boldness, patience and resourcefulness materialized the structures conceived by the designers.

The designers were master minds in evolving grace with dignity, strength with rigidity. As is natural, the scope for recognition was wider in those days, and the early designers became famous.

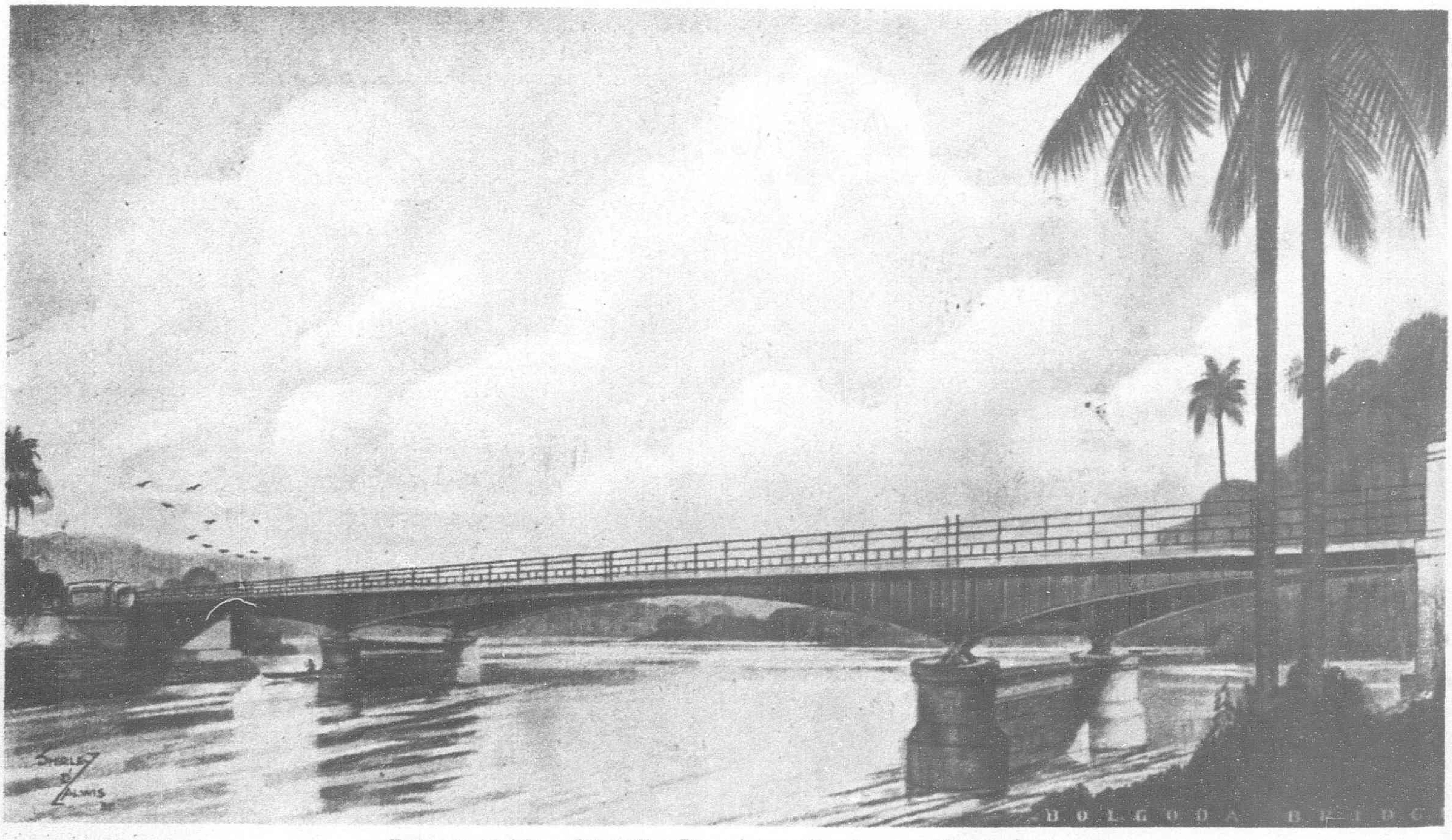
Of the contractors the name of Sir William Arrol & Co., Ltd., was as famous in the 'eighties as it is to-day. The originality displayed by this great Firm of the North of Britain made structures great and small possible; and the invention in 1875 of a machine to drill all the component plates and angles of the booms of heavy girders opened the field to great undertakings. The designers were at last to be satisfied. Concentrated attention led to the development and improvement of plant and the invention of new types. Invention followed invention for surmounting difficulties of construction and the Firm produced such gigantic structures as the Tay Bridge, the Tower Bridge (the heaviest yet made) and the Forth Bridge—one of the largest cantilever structures in the world.

Mild steel was first used in the year 1880 and the Forth Bridge was the finest bridge of importance to be constructed with this metal. Since then great achievements have been made and mild steel has been a boom to engineers the world over.

The early designers created structures of enduring beauty and character. In designing modern structures however small we apply the experience of the past: every step forward in design is evolved from proved experience in the past.

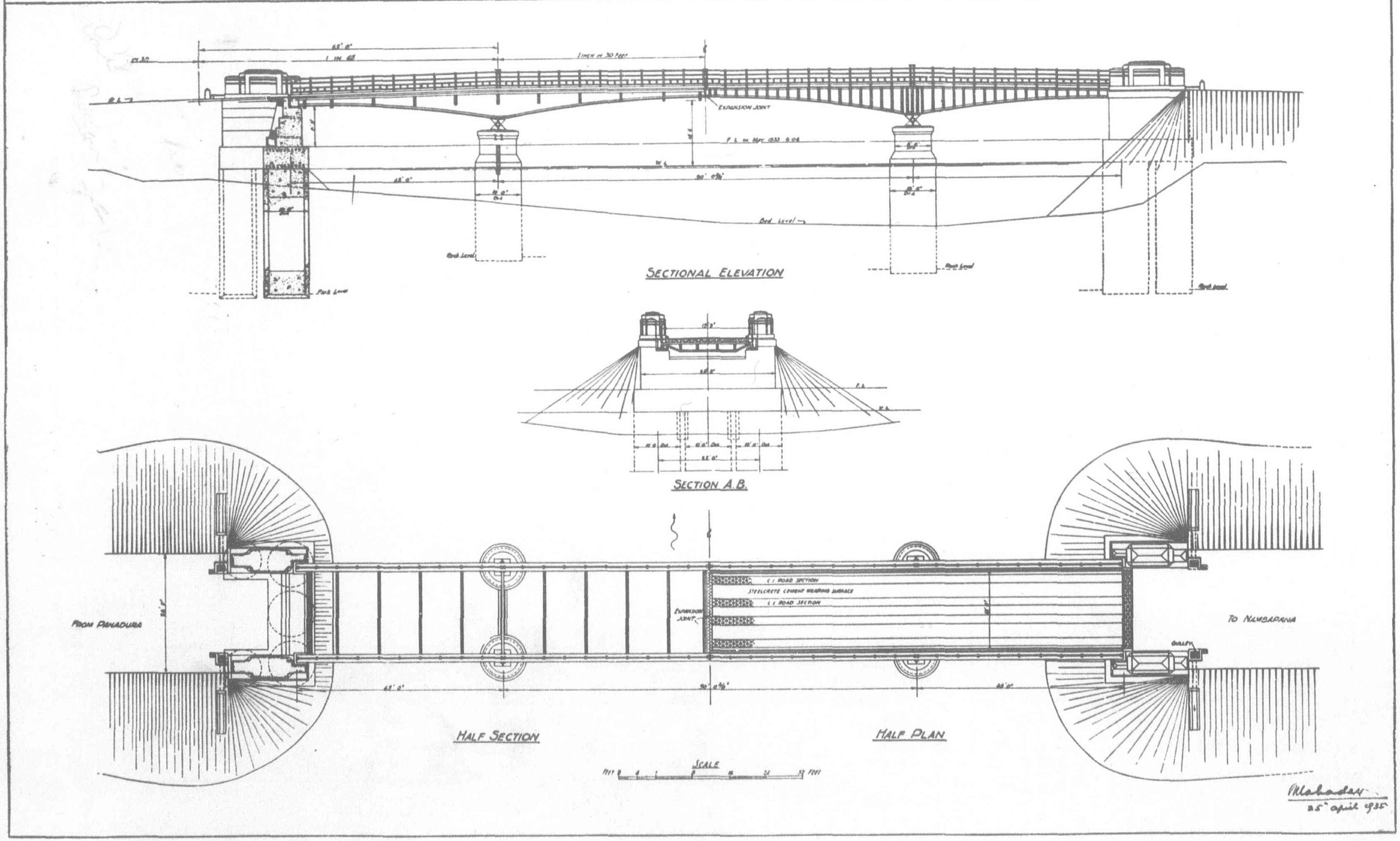
It is the execution of ennobling structures of such varied character in principles of design, function and form that has to be learnt by new members of the profession who are but diminutive dwarfs beside the old giants; for example one may mention the Forth Bridge with a total span of 8,295 feet, 60,000 tons of steel, and cantilevers of 680 feet; the Tay viaduct of 10,711 feet and 27,370 tons of steel; the Scherze roller lift bridge; the Wear bridge at Sunderland of 330 feet river spans and 9,000 tons of steel in all; the Tower Bridge with a central opening of 200 feet and two open leaves weighing 1,200 tons each, marvels of engineering—the more to be marvelled at considering the difficulties of the day in labor, materials and machinery for fabrication and construction.

In the present day the aims of design are subject to political and economical considerations in many of our undertakings. That designers are not wanting is proved by the Sydney Bridge, that glowing example of design and craftmanship.

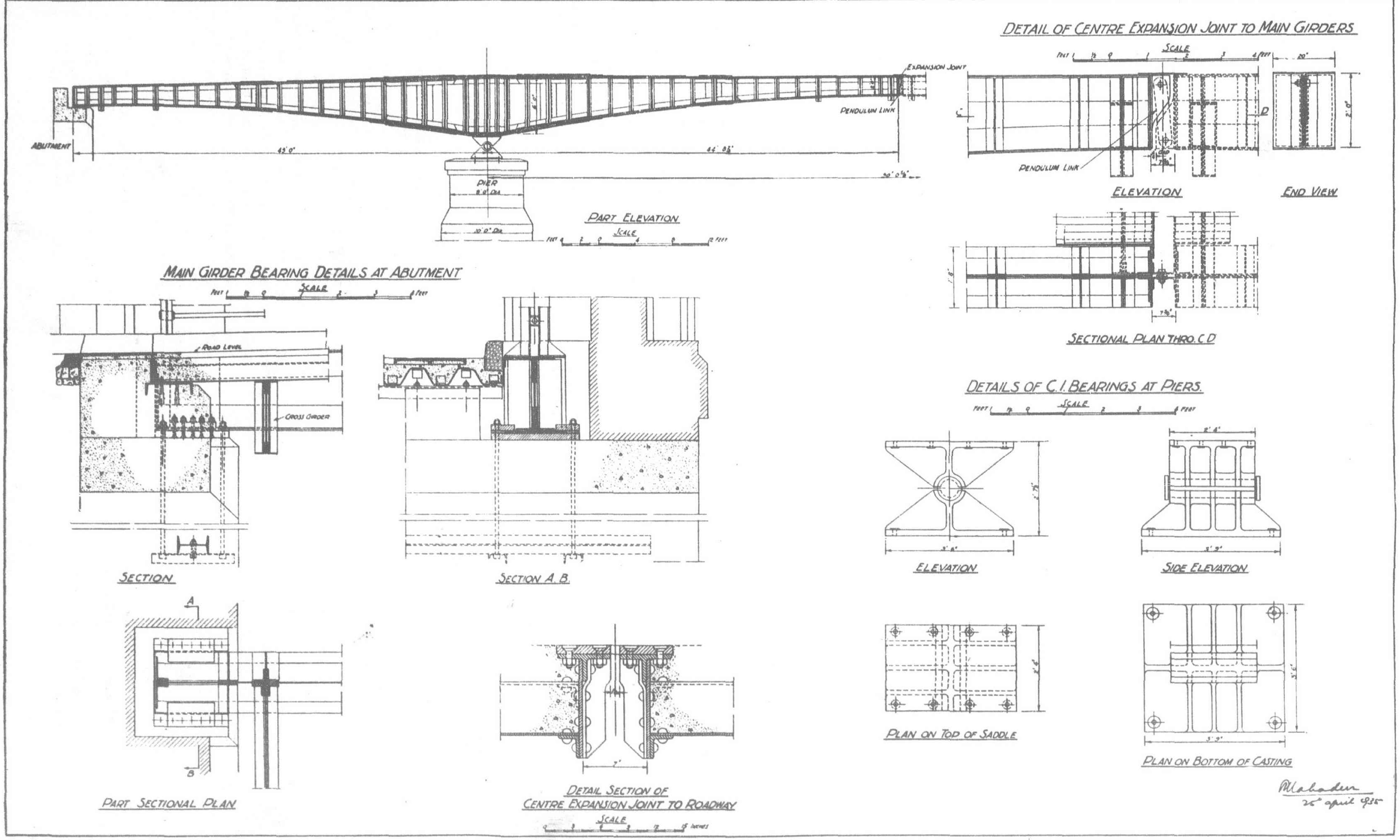


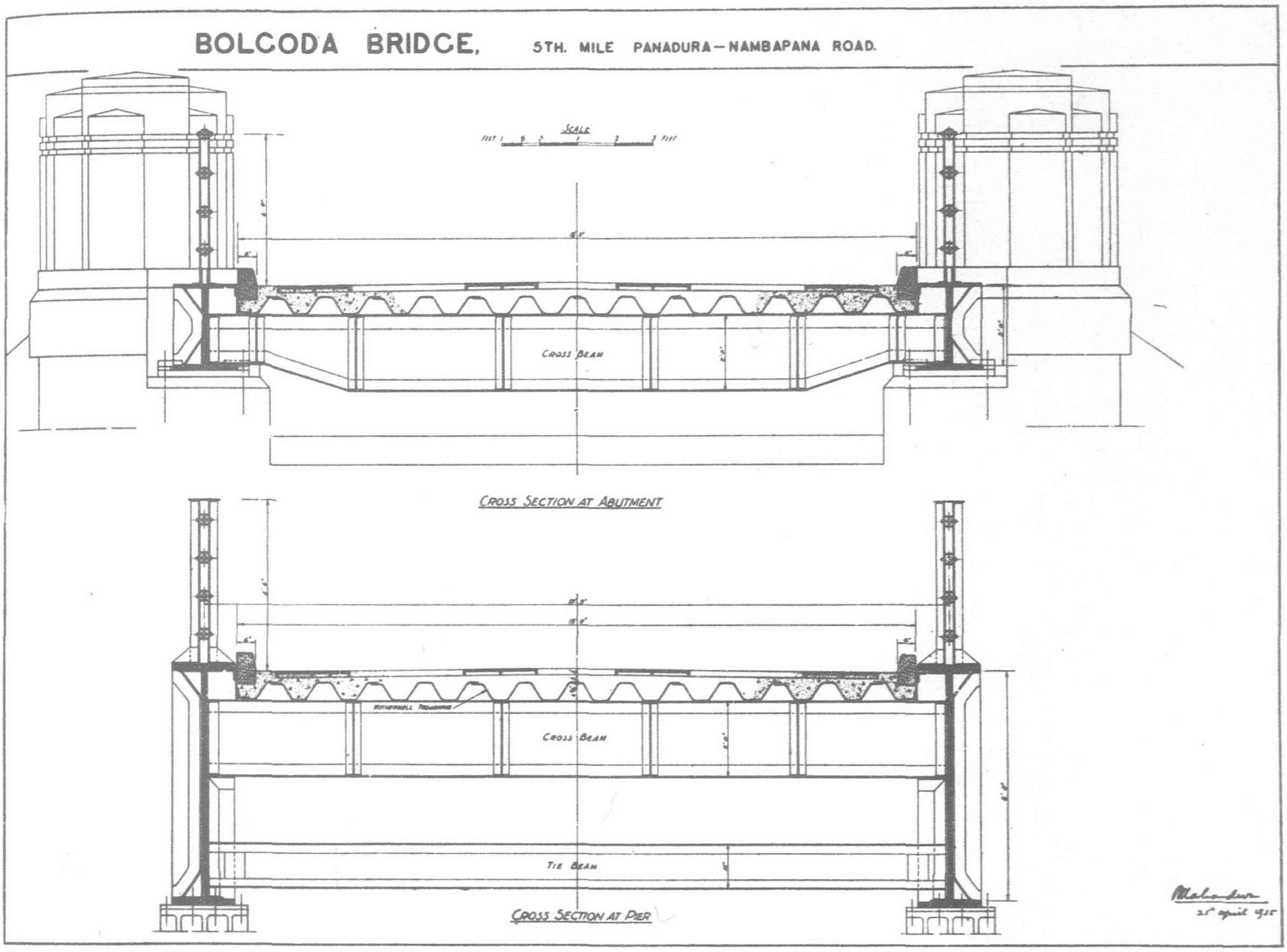
Bolgoda Bridge, 5th Mile, Panadura—Nambapana Road, Ceylon

BOLCODA BRIDCE, 5TH. MILE PANADURA - NAMBAPANA ROAD.



BOLCODA BRIDCE, 5TH. MILE PANADURA—NAMBAPANA ROAD.





Design—Singular for Ceylon

The subject of the paper, however, is a particular design of singular type at present in Ceylon : a venture in bridge construction not lacking in boldness, but with function and economy duly considered.

Utilizing the opportunity afforded by Government's Five-year plan for roads to be carried out with assistance from the Road Fund, the Ministry of Transport in Great Britain has recently issued a circular emphasizing the value and importance of right proportions and artistic character in highway bridges. I would like to quote in full an article on the circular which appeared in the *Surveyor* of March 1, 1935, but content myself by giving the gist of some of the comments which were particularly striking.

Mr. Hore-Belisha urges that special care should be taken to see that new bridges and reconstructed bridges are of pleasing design and suitable to their surroundings. It is possible for a bridge to comply with regulations prescribed for the strength of such structures and yet fall short of the legitimate expectations of the public in the matter of architectural design and suitability to its surroundings.

He adds that there is no reason to assume that the provision of bridges pleasing in themselves and harmonious with their settings will add to the cost of construction, and experience confirms that bridges are more frequently criticized for undue elaboration than for well-proportioned simplicity.

As far as records show, the first bridge of the type adopted for Bolgoda was the Dalginross bridge at Comrie also constructed by the Firm of Sir William Arrol & Co., Ltd. The bridge was of a novel type of construction and the design was known as " constrained cantilevers " from the method devised for connecting the ends of the cantilevers where they meet at the center of the waterway by a " pendulum link."

The bridge at Comrie had four main girders of this type at six feet four inches centers placed under the roadway. They are 18 inches deep at the abutments, 4½ feet at the piers and 16 inches at center of the middle span. The opening between abutments was 200 feet, divided into two side spans of 55 feet and a center span of 90 feet.

The width of roadway was 20 feet between kerbs with a footway of five feet width on each side. The road was on a slight grade to the center to conform æsthetically with the outline of the arches formed by the cantilevers.

The Dalginross Bridge referred to above was the first of this type in the British Isles. The latest one is perhaps the bridge of similar design and features at Fladbury. The latter bridge was completed in July, 1933, by the Worcestershire County Council over the river Avon, at Fladbury. The bridge replaced an old wrought iron structure of lattice design built in 1887. The change was therefore effected after 46 years.

In this case the design of constrained cantilevers was adopted because of the countryside and the desirability to harmonize with the surroundings, an example of æsthetics in engineering design. The steelwork was finally painted in shades of green to blend with the natural vegetation of the banks.

Fladbury Bridge is not only the latest bridge of the cantilever type, but also the first modern steel bridge built by the County Council. The British Steelworks Association was consulted as to details of the newest practice in steel construction.

The total span is 200 feet between faces of abutments as against the same opening of the Comrie bridge, and 180 feet of the Bolgoda Bridge, the central span between centers of piers being 100 feet three inches, against 90 feet of the Bolgoda Bridge. The carriage way is 18 feet as in Bolgoda but the Fladbury Bridge has two foot-paths of four feet each.

At Fladbury the center pier cylinders are 12 feet diameter steel cylinders sunk 10 feet to 12 feet below river bed into clay, and filled with a hearting of mass concrete. The largest cylinder sunk by the Public Works Department in Ceylon is 10 feet diameter and this is found to be economical from the point of view of handling and construction. Steel cylinders were not considerd suitable at Bolgoda as the water was subject to brackishness, and corrosion at average water level would accelerate the deterioration of the metal.

The abutments at Fladbury were built on piles. At Bolgoda cylinders were decided upon as likely to be more suitable.

The Steelwork and Superstructure

An authority on engineering construction has stated that concerning all types of bridges the importance of selecting an appropriate form increases with the length of the span ; the choice of design is then narrowed, a correct decision becomes more difficult, and an error in judgment or departure from the exact form which may be best for the purpose in view, tells with great effect.

One of the advantages of cantilever bridge construction is that it allows of erection over wide rivers or ravines without expensive temporary staging.

All the above and similar considerations were weighed and compared before the design for the new bridge at Bolgoda was finally adopted.

It will be seen from the drawings that the steelwork consists of two pairs of main cantilever plate girders. The girders are supported at their deepest section, which is six feet, on special cast iron bearings, and connected at the center of the main span by a pendulum link as in the Comrie Bridge. They are held in position at the abutments by specially designed bearing ends.

The main girders are of simple design, six feet at the deepest point and two feet at the ends. Their flanges consist of mild steel plates designed as for ordinary plate girders, diminishing in thickness towards the extremities according to stress conditions. Tall gusseted Tee irons have been arranged on both faces of girders, spaced to provide adequate stiffening at the most effective points.

Roadway

The width of roadway is 17 feet clear between kerbs, the centers of the main girders being 19 feet nine inches. The width of roadway is the standard approved by the Ceylon Transport Commission for bridges providing two lines of traffic. The roadway has a cross camber of one inch in eight feet and a longitudinal camber following the lines of the steel work and the formation of the arched cantilever opening.

In designing the surface of roadway special attention has been paid to the nature of the traffic which it will carry. It provides both for transport vehicles of 50 years ago which are still in use and for modern vehicles.

A few years ago when fast traffic came into use and the surface treatment of roads with tar emulsions became universal, it was observed that the ordinary tar macadam had its drawbacks in bridge platforms.

Heavily laden carts to and from the principal towns created furrows in their wheel tracks and reduced the ordinary macadam road to a corrugated platform. The impact of heavy and swift moving vehicles on such a surface causes tremendous impact stresses and undue vibration of the structure. Therefore granite sett paving was introduced on bridges.

The setts were of stone nine inches by five inches by four inches thick. Their weight alone added to the area of steel required. Setts while being good enough in far off places proved unsatisfactory in principal bridges where the bullock carts created definite lines of wheel tracks. Victoria Bridge in Colombo provides a good example of such conditions. The wear is great and such as to show that the traffic coming into Colombo has done more harm than the outgoing traffic, indicating that the heavier vehicles are those that come daily into town with food products, timber and other articles.

The roadway in the Bolgoda Bridge therefore has iron paving. The wheel tracks are paved with "Tripedal Castings" for a width of two feet for each wheel line. The castings are to be imported from Messrs. Iron Roads, Ltd., and set in special Asphaltum prepared for the purpose by Messrs. Socony Corporation, Ltd.

The question of temperature on the iron surface has been considered as far as knowledge permits. Experience alone will test and prove the design.

The area between the Cast Iron Sections will be surfaced with two inches thickness of special Steel-Crete cement wearing surface, the specification of which furnished by the manufacturers is as follows :—

(A) The wearing surface shall be of a total thickness of two inches laid over the cement concrete slab.

The wearing surface shall be laid in two thicknesses consisting of :—

(i). 1½ inch thick granolithic surface composed of two parts granite chips, one part sand and one part cement, with the latter of which has previously been incorporated grey Steel-Crete equivalent to half the weight of cement used.

(ii). A finishing coat of ½ inch thick Steel-Crete rendering composed of two parts of sand and one part of cement with Steel-Crete equivalent to the weight of cement used.

(B) When rendering has been formed to required camber sprinkle evenly over the surface of the whole area a mixture of 2-lbs. cement and 2-lbs. Steel-Crete per square yard of area and thoroughly trowel the surface with a steel float until the required finish is obtained. When surface is sufficiently set cover over with clear fresh water for a week.

Brush off surface and when dry paint with two coats road tar as in macadam roads.

The edge of roadway along the steel girders is finished with well dressed stone kerbing of standard profile.

The iron paving and the Steel-Crete wearing surface are bedded on cement concrete filling 4 : 2 : 1 mixture in steel troughing four inches deep rolled by Messrs Motherwell & Co. The troughing is supported at nine feet centers by built-up plate cross girders spanning the main girders.

Cross Girders

It will be observed that, contrary to the general practice the cross girders are not mounted on the main girders : this is because of the camber of the latter, the varying thickness of flange plates, and difficulties in erection and painting of the steel surfaces in confined formations. The arrangement also enables the cross girders to act as an integral part of the stiffening arrangement for the structure. At the shallow ends of the cantilevers the ends of the cross girders are themselves reduced in depth.

Sway bracing is provided by broad flanged built-up cross beams.

In the choice of depth of girder and dimensions of sections market widths of rolled steel plates have been kept in view. The deepest web plate is limited to six feet and the positions of the joints in the main girders have been designed to afford the maximum economy in plate length, sections convenient for transport, ease of fabrication, erection and assembly, and also with relation to the stiffening points so as not to foul the vertical stiffeners that are indispensable.

The handrailing in a bridge of this type has to be of suitable section and shape to harmonize with the general lines and afford reasonable protection to fast moving heavy vehicles. Recently the ordinary gas tubing attached to the lattice bars of Victoria Bridge were wrenched out by a 'bus that strayed off the track and rode the pavement of the bridge.

No attempt is made in the design of the handrailing to provide a buffer for such adventurous vehicles, but the railing will give the normal protection intended for vehicles using the roadway.

Main Girders; the Pendulum Link

As already stated there are only two main girders to each span, making four cantilever girders for the whole bridge supported on four cast iron rocker bearings on the four pier cylinders.

The ends of the cantilevers are connected by a pendulum link. The mechanism constrains the ends to deflect together and enables the smooth passage of vehicles from one cantilever span to the other without shock or impact at the joint. The link is designed as a strut, pin jointed at ends, capable of taking maximum shear at the section and consists of a mild steel flat four inches by one inch by two feet long with 1¾ inch diameter pins.

While constraining the cantilever ends to deflect together vertically, the mechanism being pin-jointed offers no constraint to bending at the joint.

Any other method of fixing would have upset the assumption of cantilever design altogether by converting the main girders into a rigid arch or one pin-jointed at the crown.

A space of 1½ inch is allowed between the ends of the girders; and in order to permit movement and expansion the edges of the roadway are provided with C.I. traffic tread plates across the bridge, the maximum clearance between the plates being one inch.

The cantilever ends at abutments are not fixed. Provision is made for expansion and moderate movement vertically to prevent the rigid arch formation.

The bottom flange of the end of the girder is held in alignment by mild steel clip plates one foot three inches by eight inches by two inches thick on either side of it.

These clip plates are secured to the bed plates by ⅞ inch diameter bolts counter-sunk and feathered at underside of bed-plate. The bed-plate is held down by four 1¼ inch diameter holding down bolts.

The maximum pull at each girder on bolts has been reckoned at 21.65 tons, and the system of bearing girders in the abutment capping has been designed to meet that.

The weight of each main girder is 13 tons, and that of each cast iron bearing exclusive of bolts, etc., three tons. The weight of the total steelwork supported on the pier caps is 146 tons on each pier. The total load when bridge is fully loaded is 73 tons on cap of each cylinder.

The maximum bearing pressure at the base of each cylinder for the piers is four tons per square foot assuming the level of rock as shown on drawing and recorded by borings.

An advantage of the design from the aspect of corrosion is the exposure of the minimum area of the steelwork to the action of the weather. The only areas exposed are the top flanges and the outer faces of the main girders, the remainder of the steelwork being under cover by the bridge roadway itself.

Standard of Loading

According to the standard of traffic permitted on roads by this department the bridge would be classified among those for six ton traffic, that is those capable of taking a train of trucks extending over the full length of bridge with five ton axle loads at six feet centers and another train 70 feet long passing in the contrary direction. For concentrated loads a single ten ton steam roller is reckoned at center of span of cross girder with its hind wheels over the girder.

This standard of loading is higher than that adopted by the Crown Agents for Colonial Bridges, in which only eight ton trucks are taken with four ton axle loads at ten feet centers.

The standard adopted by the Department is equal to that of the British Standard for Road Bridges where the trucks or trailers are 13½ tons with axles of 6¾ tons at ten feet centers. The Ministry of Transport Standard is however higher as it provides for 13 ton trailers with axles at eight feet centers and trailers ten feet apart and includes a 50 per cent allowance for impact.

The limiting stresses for the steel in this bridge are well within the British Standard Specification for Steel Bridges, No. 153, part 3, 1923—where for steel in tension it is eight tons per square inch, compression less according to the form of section, and shear five tons per square inch.

British Standard Specification No. 153 is now under revision and it is understood that one of the amendments will be the raising of the permissible stresses for new steel.

The Abutments and Piers

The foundations of piers and abutments are of cement concrete cylinders ten feet diameter below water level. Above water level the piers consist of eight feet diameter cylinders, but the abutments and wings are of concrete on deep reinforced concrete capping over the cylinder foundations.

The cylinder rings are one foot thick with concrete of 1 : 2 : 4 composition. All cylinders are to be sunk to rock foundation. The hearting for the lowermost six feet depth and the uppermost six feet depth is to be of 4 : 2 : 1 concrete, and for the intermediate depth it is to be of 6 : 3 : 1 concrete with 30 per cent plums.

The cylinder caps are connected together by steel girders which receive the holding down bolts of the main bearings.

Precast concrete flood diaphragms are provided between cylinders to a depth of six feet, between the levels of flood and normal water. The entire steelwork inclusive of bearings will be above H.F.L.

The head room at center of archway of the central span is nine feet and would permit the passage of padda-boats and other vessels not requiring more than that clearance.

The width of the roadway is 26 feet at the approaches which are to be realigned and regraded to conform to the new bridge levels.

The cost of steelwork and bridge platform is estimated at Rs. 85,000, and the foundations, abutments and approaches at Rs. 100,000. As the bridge is still under construction it is not possible to give final figures.

Acknowledgments

The drawings forming part of the paper have been prepared specially for the purpose and are not working drawings. As the bridge is under construction a perspective of the bridge has been drawn with the kind permission of the Senior Architect Mr. Wynne-Jones by his Assistant Architect Mr. Shirley d'Alwis.

My thanks are due to the Director of Public Works for granting permission to read the paper and have access to official documents and to Mr. Wynne-Jones and Mr. Shirley d'Alwis for the perspective which admirably portrays what the bridge will look like when completed.

This passage from " the Stones of Venice " presenting Ruskin's appreciation of a designer's difficulties may prove interesting and form a fitting conclusion to the description of a new departure in engineering design in Ceylon:

" Suppose for instance, we are present at the building of a bridge, the bricklayers or masons have had their centering erected for them, and that centering was put together by a carpenter, who had the line of its curve traced for him by the Architect. The masons are dexterously handling and fitting their bricks, or, by the help of machinery, carefully adjusting stones which are numbered for their places. There is probably in their quickness of eye and readiness of hand something admirable, but that is not what I ask the reader to admire, not the carpentering, nor the bricklaying nor anything that he can presently see and understand, but the choice of the curve, and the shaping of the numbered stones, and the apportionment of that number. *There were many things to be known and thought upon before these were decided.* The man who chose the curve and numbered the stones had to know the times and tides of the river, and the strength of its floods, and the height and flow of them, and the soil of the banks, and the endurance of it, and the weight of the stones he had to build with and the kind of traffic that day by day would be carried over his bridge—all this especially and the great general laws of force and weight, and their working; and in the choice of the curve and numbering of stones are expressed not only his knowledge of these, but such ingenuity and firmness as he had in applying special means to overcome the special difficulties about this bridge. There is no saying how much wit, how much depth of thought, how much fancy, presence of mind, courage, and fixed resolution there may have gone to the placing of a single stone of it."

Japanese Plans in New Guinea

According to Japanese papers, the South Sea Industrial Development Co., capitalized at Y.20,000,000 and affiliated with the Oriental Development Co., has decided to go into cotton planting on a large scale in Dutch New Guinea. This concern for several years has been making satisfactory profits from sugar and cotton in the Japanese mandated islands. For some time it has been negotiating with the Dutch East Indian Government for lease of 60,000 *chobu* (about 147,000 acres) at Geelvink Bay on the northern coast of New Guinea. Now it is stated papers have been signed giving the Japanese concern a lease for 75 years. The Japanese company expects to raise about 30,000 bales a year. The *Nichi Nichi* further reports that the company wants to develop the uncivilized parts of New Guinea and other Dutch territories and will ask Dr. Haruichi Nagaoka, recently appointed judge of the Permanent Court of International Justice at the Hague, to negotiate with the Dutch Government for permanent leases.

The Coal Industry in China

By HUANG CHIN TAO, Director, Mining Department, Ministry of Industry

According to the latest estimate made by the Government Geological Survey, the coal reserve in China is about 248,000,000,000 tons, most of which is in North China, where mining is carried on largely by modern methods. In places where means of communication are poor, and where production is intended solely or mainly for local consumption, coal is obtained from pits or small shafts worked by primitive native methods.

In Central China along the Yangtze Valley, although a few mines are being worked, production is not sufficient to meet the demand ; and the market in the Yangtze region still depends upon imported coal to supply industrial and household requirements. The quantity of foreign coal imported into the Yangtze Valley is between 1,000,000 and 2,000,000 tons every year, and imports into Canton and other places in South China exceed 600,000 tons annually. The distribution of coal in China is estimated as follows :—

Province	*Million Tons*	*Province*	*Million Tons*
Shansi	127,127	Kwangtung	421
Hopei	3,071	Kwangsi	300
Shantung	1,639	Fukien	500
Honan	6,624	Kansu	6,000
Shensi	71,950	Sinkiang	6,000
Hupeh	440	Suiyuan	417
Anhwei	437	Chahar	504
Kiangsi	969	Jehol	614
Chekiang	969	Liaoning	1,836
Kiangsu	217	Kirin	1,143
Hunan	4,000	Heilungkiang	1,017
Szechuen	9,874		
Yunnan	1,627		248,287
Kweichow	1,549		

Bituminous coal represents about 77.9 per cent of the above reserve, anthracite about 20.7, and lignite about 1.2 per cent.

Coal Production

The record of coal production in China annually since 1912 is as follows :—

	Tons		*Tons*
1912	8,987,862	1924	25,768,875
1913	12,799,771	1925	24,255,042
1914	14,102,339	1926	23,040,119
1915	13,416,666	1927	24,172,009
1916	15,902,616	1928	25,091,740
1917	16,902,260	1929	25,437,480
1918	18,339,502	1930	26,036,564
1919	20,054,513	1931	27,214,673
1920	21,259,610	1932	18,665,000†
1921	20,459,411	*1933	19,000,000‡
1922	21,097,420	*1934	20,000,000‡
1923	24,552,029		

It will be seen that the coal production in 1931 for the whole of China was about double that of 1915, and about three times as much as 1912. Only since 1931, when the production of the North-Eastern Provinces was lost owing to the Japanese occupation of Manchuria, have the figures become smaller, but they still show a gradual increase every year.

The following table shows the import and export of coal during the last three years :—

	Import (Tons)	*Export (Tons)*	*Excess of Import (Tons)*
1932	1,420,931	612,821	808,110
1933	1,978,658	582,529	1,396,129
1934	1,038,436	811,996	226,440

The yearly consumption of coal for China Proper is estimated at 22,000,000 tons, but with the development of industries will be soon increased to 25,000,000 tons. If production remains at 20,000,000 tons, the only way to make up the deficiency will be to buy foreign coal ; but this will cause a loss of national wealth, and it is necessary, therefore, to develop new collieries or improve those existing in order to increase domestic production.

The Four-Year Plan

The following are some of the steps to be taken for the development of the coal industry in China in accordance with the Four-Year Plan drawn up by the Ministry of Industry :—

(1) The first step is to develop those fields producing coal suitable for coke-making in the northern, central and southern territories of China, so as to provide sufficient fuel for metallurgical purposes in accordance with the Four-Year Plan for the iron and steel industries.

(2) When the production of coking coal is sufficient for the requirements of iron and steel works, the next step will be to increase output along the Yangtze Valley, so that both industrial and household requirements may be independent of foreign supplies.

(3) The development of coal-mines under Government control in this Plan shall not interfere with privately-operated collieries, and the Government shall give protection and encouragement to private as well as state mining enterprises.

(4) When Government-operated and private collieries are producing enough coal for industrial and household consumption, steps will be taken to increase the output for export.

(5) As transportation is of great importance in the development of coal-mines, co-operation shall be effected with the Ministry of Railways and the Ministry of Communications to build railways, construct wharves, and provide sufficient rolling-stock, ships, and tugs for the requirements of all collieries, whether under State or private control.

The fields which the Ministry of Industry intends to develop in North, Central and South China, as laid down in the Four-Year Plan, are as follows :—

North China.—The Tsuhsien coal-field in the province of Hopei. Concession of part of this field has been already secured for Government operation. The bituminous reserve is about 470,000,000 tons.

The Chaitang coal-field near Peiping, originally a concession secured by the Chaitang Coal Mining Company, under joint Government and private control. A railroad connecting Mentoukou, on a branch line of the Peiping-Suiyuan Railway, with Chaitang is now under construction, but owing to lack of funds has not yet been completed. The bituminous reserve is about 85,000,000 tons.

Central China.—The Leichiakou coal-field in the province of Anhwei, along the Tientsin-Pukow Railway, already under survey by the Ministry. The bituminous and semi-anthracite reserve is over 30,000,000 tons.

The Paituchai coal-field in the province of Kiangsu, already under survey by the Provincial Government. The bituminous reserve is about 32,000,000 tons.

The Pinghsiang coal-field in the province of Kiangsi, along the Pinghsiang-Chuchow Railway. The coal from the Kaokeng mine at Pinghsiang is very suitable for coke-making, and the Ministry of Industry is planning to secure a concession in this area for Government operation. The Ministry is also contemplating taking over management of the Pinghsiang collieries, so that steps can be taken to improve them. The bituminous reserve is about 320,000,000 tons.

The Hsuanching coal-field in the province of Anhwei, on the southern bank of the Yangtze, and adjoining the proposed Wuhu-Hsuanching Railway. Already some mines have been developed in this area by the Provincial Government. The bituminous reserve is about 70,000,000 tons.

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*Approximate estimate.

†(Excluding production in the Three Eastern Provinces).

‡(Excluding production in the four North-Eastern Provinces).

The Fengcheng coal-field in the province of Kiangsi, near Nanchang, capital of the province. The coal found here includes anthracite and bituminous. Should this field not be developed, the field in Yukan, or the field in Poyang may be taken instead. The anthracite reserve is about 30,000,000 tons and bituminous about 50,000,000 tons.

South China.—The Kuangshao coal-field in the province of Kwangtung, near Shaokuan, along the Canton-Shaokuan-Hankow Railway. This coal is suitable for coke-making, and part of this field is already being worked by the Provincial Government. The bituminous reserve is about 200,000,000 tons.

According to this Plan, if in four years the three plants for making iron and steel are completed on schedule, the yearly consumption of coke will be 900,000 tons, equivalent to 1,600,000 tons of good bituminous or coking coal. In addition, there should be produced another 2,000,000 tons to replace the foreign coal imported into the Yangtze Valley and southern ports. Moreover, on completion of the Four-Year Plan, various industries along the Yangtze Valley will have been developed, and the coal consumption for industrial purposes will have increased yearly, possibly by over 1,000,000 tons. Thus, the Four-Year Plan of the Ministry aims at securing a yearly production of 5,000,000 tons of coal for all purposes without, however, interfering with existing private collieries.

If the iron and steel works in North, Central, and South China respectively are not all completed according to the Four-Year Industrial Plan, and if the production of coal works out as contemplated, there would be a surplus of 1,000,000 tons at the end of the fourth year, and this yearly surplus could be disposed of in foreign markets. All the private collieries will have to maintain their usual rate of production to meet already established demand; and with the possible development of industries in the North-Western territories, will probably have to increase their output. It should be mentioned here that in order to carry out the Four-Year Plan for the development of the coal industry, the investment of more private capital is urgently needed.

According to the Plan, therefore, the first step is to secure enough coal for coke-making for the three iron and steel works; the second step is to increase production along the Yangtze Valley both for industrial and household purposes, and the third step is to dispose of surplus production by export. The following is an outline of the Four-Year Plan for the development of coal mines, the amounts in brackets indicating the funds needed for development, not including running expenses for production :—

First Year

North China

(1) Opening the Chaitang mine and completing the Mentoukou-Chaitang Railway ($1,000,000).

(2) Opening the Tsuhsien mine ($1,000,000).

Central China

(1) Prospecting and opening the Leichiakou mine, and completing the Fulichi-Leichiakou Railway; daily production at 500 tons ($2,500,000).

(2) Reorganizing and repairing the Pinghsiang mine; daily production 800 tons ($250,000).

(3) Prospecting the Potutsai mine ($200,000).

(4) Prospecting the Hsuanching mine ($200,000).

(5) Prospecting the Fengcheng mine ($200,000) or (alternatively prospecting the Yukan or Poyang mine).

South China

(1) Prospecting the Kuangshao mine ($500,000).

Total expenditure for the first year: $5,850,000. Total daily production for the first year: 1,300 tons.

Second Year

North China

(1) Further constructional work at the Chaitang mine; daily production 500 tons ($1,500,000).

(2) Further constructional work at the Hsuhsien mine; daily production 800 tons ($1,400,000).

Central China

(1) Extending the Leichiakou mine; daily production 1,500 tons ($3,000,000).

(2) Daily production of the Pinghsiang mine: 800 tons.

(3) Opening the Potutsai mine ($1,000,000).

(4) Opening the Hsuanching mine ($2,000,000) and constructing Wuhu-Hsuanching Railway (to be built by the Ministry of Railways).

(5) Opening the Fengcheng mine ($800,000) and constructing the Nanchang-Fengcheng Railway (to be built by the Ministry of Railways).

South China

(1) Opening the Kuangshao mine; daily production at 500 tons ($1,500,000).

Total expenditure for second year: $11,200,000. Total daily production for second year: 4,100 tons.

Third Year

North China

(1) Extending the Chaitang mine; daily production 1,000 tons ($1,500,000).

(2) Extending the Tsuhsien mine; daily production 1,500 tons ($2,100,000).

Central China

(1) Extending the Leichiakou mine; daily production 3,000 tons ($4,500,000).

(2) Extending the Pinghsiang mine; daily production 2,000 tons ($1,500,000).

(3) Daily production of the Potutsai mine; 500 tons ($500,000).

(4) Daily production of the Hsuanching mine; 1,000 tons ($1,000,000) and completion of the Wuhu-Hsuanching Railway (to be built by the Ministry of Railways).

(5) Daily production of the Fengcheng mine; 500 tons ($700,000), and completion of the Nanchang-Fengcheng Railway (to be built by the Ministry of Railways).

South China

(1) Extending the Kuangshao mine; daily production 1,500 tons ($3,000,000).

Total expenditure for third year: $14,800,000. Total daily production for third year: 11,000 tons.

Fourth Year

North China

(1) Extending the Chaitang mine; daily production 2,000 tons ($3,000,000).

(2) Extending the Tsuhsien mine; daily production 2,000 tons ($1,500,000).

Central China

(1) Daily production of the Leichiakou mine; 3,000 tons.

(2) Daily production of the Pinghsiang mine; 2,000 tons.

(3) Extending the Potutsai mine; daily production 1,000 tons ($1,300,000).

(4) Extending the Hsuanching mine; daily production 2,000 tons ($2,800,000).

(5) Extending the Fengcheng mine; daily production 1,000 tons ($1,300,000).

South China

(1) Extending the Kuangshao mine; daily production 3,000 tons ($4,000,000).

Total expenditure for fourth year: $13,900,000. Total daily production for fourth year: 16,000 tons.

Under the foregoing schedule, the mines so developed will by the end of the fourth year have a daily production of 16,000 tons of coal, or a total yearly production of 5,500,000 tons. The reserve of the above-mentioned fields will be quite ample for at least forty years' continuous working without exhaustion, if operated on the above daily rates of production.

Organization of Mines

The total capital invested in all the collieries in China, including those of the four North-Eastern Provinces, is $224,152,025 ; details are shown in the following table :—

Ownership	*Capital*	*Percentage*
Purely Chinese	$108,087,144	48.22
Sino-Japanese	29,988,093	13.38
Sino-British	31,363,158	13.99
Sino-German	4,500,000	2.01
Sino-Russian	24,000,000	10.67
Purely Japanese	26,213,630	11.69
	$224,153,025	

The larger collieries operated entirely with Chinese capital are given below :—

Province	*Name of Company or Colliery*	*Capital*
Kiangsu	Hwatung Co.	$1,200,000
Chekiang	Changhsin Co.	6,300,000
Anhwei	Lih-Shan Co.	1,000,000
,,	Sui-tung Colliery	1,090,000
,,	Hwei-nan Colliery	1,400,000
Shantung	Chung-Hsing Co.	7,500,000
,,	Yo-sun Colliery	1,300,000
Hopei	Cheng-fong Co.	6,600,000
,,	Ye-lih Co.	3,000,000
,,	Liu-kiang Co.	1,440,000
,,	Chang-chen Co.	1,500,000
,,	Ling-chen Colliery	3,500,000
,,	Chai-tang Co.	5,591,000
Honan	Liu-Ho-Kou Co.	3,000,000
,,	Tsi-tsong Colliery	1,000,000
Shansi	Po-ching Co.	2,863,641
,,	Tsin-peh Colliery	1,000,000
,,	Tungpao Colliery	3,000,000
Kiangsi	Pinghsiang Colliery	12,000,000
,,	Po-loh Co.	2,700,000
Kwangtung	Fu-kok Co.	1,000,000
Liaoning	Si-an Colliery	1,460,000
,,	Pah-dor-hou Colliery	1,000,000
,,	Fu-chow-wan Colliery	2,500,000
,,	Yu-tung Colliery	1,000,000
,,	Nei-tse-shan Colliery	1,500,000
Heilungkiang	Ho-kiang Colliery	3,115,575
Jehol	Pei-piou Co.	5,000,000

The larger collieries operated with Chinese and foreign capital are given below :—

Sino-Japanese :—	
Lu-tah, Co., Shantung	$ 2,500,000
Po-tung Co., Shantung	1,500,000
Wha-wu Colliery, Shantung	1,250,000
Shao-hwa Colliery, Shantung	1,000,000
Pinchihu Co., Liaoning	7,000,000
Chinkou Coll., Liaoning	1,330,000
Nan-chang Coll., Liaoning	1,000,000
Chinsi Coll., Liaoning	4,000,000
Tah-hsin Coll., Jehol	1,500,000
Tah-yao-kou Coll., Liaoning	3,000,000
Sino-British :—	
Kailan Mining Administration, Hopei	$25,000,000
Mentoukou Colliery, Hopei	2,800,000
Chong-fu Corporation, Honan	3,300,000
Sino-German :	
Chin-hsing Colliery, Hopeh	4,500,000
Sino-Russian :	
Mo-ling Colliery, Kirin	6,000,000
Tsalannar Colliery, Heilungkiang	12,000,000 rup.
Japanese Capital :	
Fushun and Yentai Collieries, Mukden	20,000,000 yen

Equipment and Method of Working

The richest fields containing the best quality of coal are concentrated in North China ; those in the Yangtze Valley come next in importance ; while those in South China are limited in number and area, and the seams are rather thin and of inferior quality.

The working of coal mines in China dates back over a thousand years ago, and primitive native methods of mining are still in use. Only within the last forty years have some of the pits made some improvement by adopting modern processes of production, and this tendency is still progressing. The newly-opened mines, such as Chunghsing, Kailan, and Liuhokou collieries, are all equipped with modern mechanical devices and are operated under an efficient system of management. Even in small mines with a daily production of one or two hundred tons, most of them are equipped with lamps, hoisting machinery, and mechanical transportation devices. The native pits are usually of the inclined type and are rarely vertical while their construction is very crude, whereas the newly-developed collieries, with a big production, mostly have vertical shafts leading to the underground workings. The following are typical examples :—

Vertical shaft—adopted by most collieries.
Vertical shaft and main adit—adopted by Pinghsing Colliery.
Vertical shaft and inclined tunnel—adopted by Liukiang Colliery, Hopei; Potung colliery, Shantung; Suitung Colliery, Anhwei; and the Poloh Colliery, Kiangsi.
Inclined shaft—adopted by Pinchihu Colliery, Liaoning.
Vertical shaft and open pit—adopted by Fushun Colliery, Liaoning.
Inclined shaft and open cut—adopted by Si-An Colliery, Liaoning.
Open cut—adopted by Hoh-kiang Colliery, Heilungkiang.

Examples of other methods of mining adopted by the large collieries are as follows :—

Long wall and sand filling method—adopted by Fushun Colliery, Liaoning.
Room and pillar, and inclined face earth-filling method—adopted by Chinhsing Colliery, Hopei.
Open cut, and sand and earth-filling method—adopted by Tzalannar Colliery, Heilungkiang.
Long wall method—adopted by Chung-hsing Colliery, Shantung, and Pinghsiang Colliery, Kiangsi.
Room and pillar and caving method—adopted by Kailan Colliery, Hopei, and Tsinpeh Colliery, Shansi.

The average cost of production of coal per ton between 1916 and 1926 was $2.45, and in 1931 averaged $3.79. This increase is due to (1) low production caused by unsettled local conditions, (2) insufficient and obsolete machinery, and (3) increased wages. However, if we compare the figure with the production cost in foreign countries in 1932, i.e. Y.4.90 per ton in Japan, $4 in Annam and India, $6 in U.S.A. and $8 in Europe, the cost in China ($3.79 per ton) is still the lowest.

Chinese laborers are capable of very hard work, and their standard of living is low. A working shift in the mine is eight hours, and their daily pay averages 50 cents.

Transportation Facilities

Although communications in the interior are not well developed, the construction of railways and highways has been speeded up during recent years, and has given great assistance to the mining industry. Nearly all the large collieries are situated close to railways, and those which are remote from the trunk line usually have a branch connecting the colliery with the main line to facilitate the transportation of coal. Facilities are also being provided for connections by rail with river and coast ports.

The most important thing to be done is to increase rolling stock and decrease freight charges and so lower transportation costs.

Mining Concessions

Coal-mining concessions granted up to the end of 1934 by the Ministry of Industry numbered 1,232, covering a total area of 12,140,163.44 *Kung Mou* (100 sq. meters=1 km.). Only in 5 per cent of these undertakings are modern mining methods wholly employed, and in 30 per cent are partially used while the remaining 65 per cent use native methods of mining exclusively.

Prospects of Development

According to most recent estimates, the annual production of coal in China is about 20,000,000 tons, and distributed among a

(*Continued on page 186*)

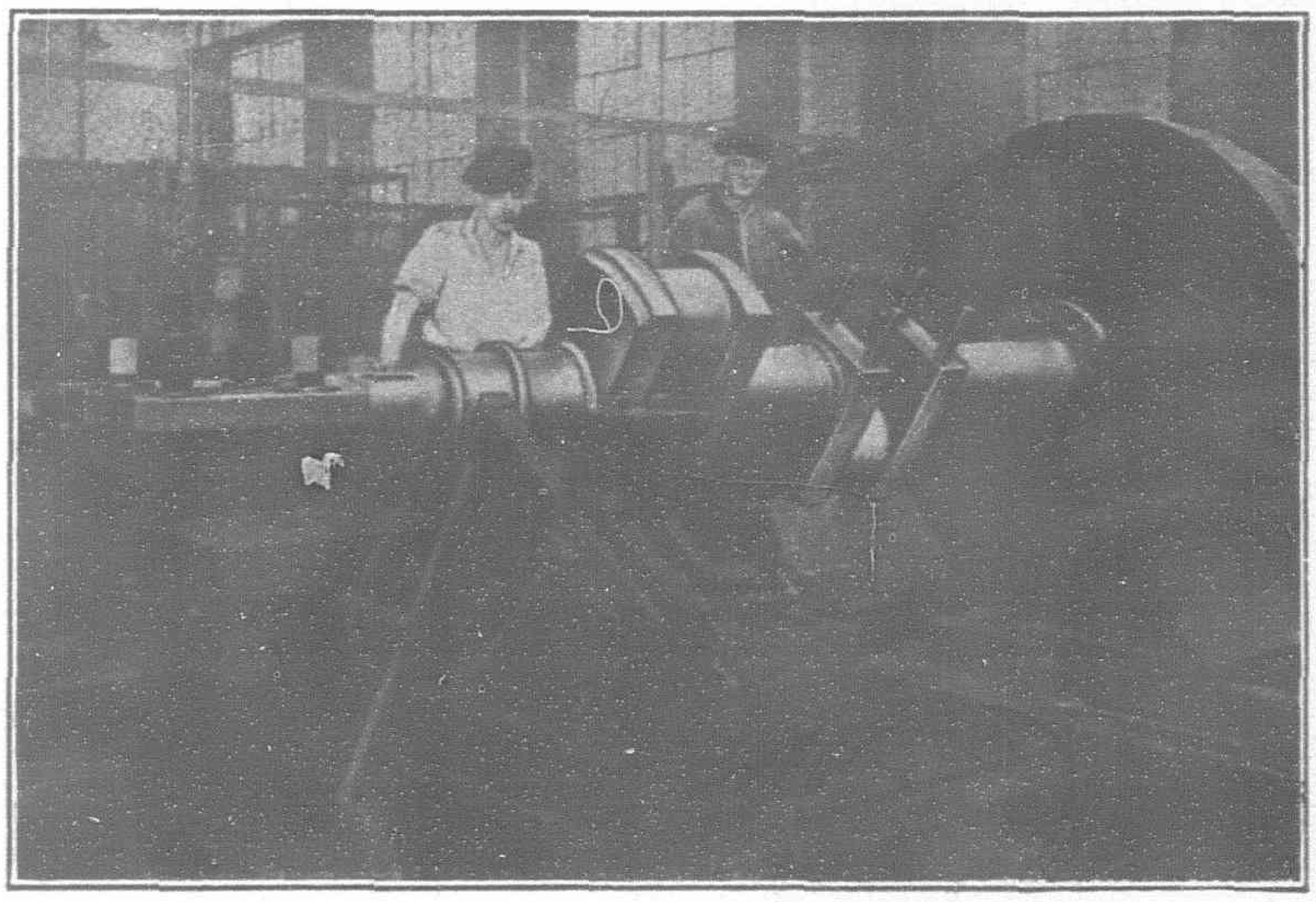
Repair Work Which Finds its Way to London

By C. W. BRETT, M.I.W.E., Managing Director of Barimar Ltd., Scientific Welding Engineers

A FEW days ago whilst walking through the welding repair shops of my London works, I was struck by the large volume of work which was being carried out for various overseas owners. No fewer than 27 cylinder blocks were receiving attention before return to the Near East, the faults which were being corrected varied considerably but all were serious. The most common troubles were fractured water jackets, broken bores, and valve seats so deeply worn and cracked that scientific rebuilding with new metal was the only satisfactory cure.

Two or three of the cylinder blocks suffered from all the troubles named and many of them were in such bad shape that the fact that they could be turned out in every way as strong as new is remarkable testimony to the skill of modern welding engineers.

In addition to these parts there was a large Diesel engine crankshaft from Malaya, whilst there had just been dispatched a case of repaired machinery for Shanghai and a particularly tricky piece of work to New York, which job, incidentally, had been turned down as impossible by several American welders owing to the fact that the cylinder block, which was the part concerned, is an aluminium casting in which steel liners are inserted. Some liners and the casting were broken and the difference in the co-efficient of expansion of the two metals made the task wellnigh impossible to any welding operators who have not had previous experience with complex work of this nature.



Large crankshaft undergoing final machining operation after a web had been repaired by a Barimer welding process

A few years ago there were very definite limits to the class of work which could be handled with complete assurance of success. Intensive scientific investigation and much practical experimental work have had the effect of increasing the scope of welding beyond all pre-conceived ideas however. Work of this scientific nature demands not only a different technique but equipment distinctly different to the simple electric oxy-acetylene torch which, however satisfactory it may be for simple operations, is not applicable in its elementary form to the exacting needs of modern repair requirements.

Practically all experimental work so far conducted has had for its chief object the accomplishment of a more perfect result by the elimination of distortion and also a reduction in cost by substantial cutting down of the time needed to complete the work.

One of the newest methods which is giving astonishing results with a wide variety of parts in cast or malleable iron is known as the Barimar low-temperature process. By the use of special equipment, heavily coated rods and other methods which have little relation to the older systems, it is possible to eliminate entirely the uneconomic process of pre-heating and subsequent controlled cooling.

Pre-heating is dictated by the distortion which inevitably follows the local application of very high temperatures to a large or intricate casting. Imagine, for example, a flywheel which requires welding attention in the region of the center boss. If a normal welding torch were applied the action would be to cause expansion in the neighborhood of the flame whilst the outer part of the wheel, remaining cool, would tend to resist this consequence with the result that distortion, cracks, or both are an inevitable sequence.

With the low-temperature process mentioned, however, the heat is so localized that even whilst the work is proceeding it is possible to put one's hand within a few inches of the repair without the least fear of being burned.

Quite apart from the question of time and money saved by being able to weld cold material another obvious advantage is the fact that by the selfsame methods it is feasible to carry out a welding repair to many machines without the need for previous dismantling. Very often this point is of paramount importance particularly when a breakdown has occurred to some portion of the plant vital to a manufacturing process.

Brief mention has already been made of the fact that by another new method crankshafts are being welded in such a manner that there is no fear of a similar fracture occurring again. Not only are hundreds of crankshafts resuscitated in this way every month but only in one instance has subsequence breakage happened and this was at a point remote from the welded repair and due to a hidden flaw in the steel.

An interesting point regarding the welding of components of this type is the fact that the process can be applied equally well to large as well as to small cranks.

The particular shaft illustrated is 10-ft. in length and weighs 1½ tons ; but this by no means represents the limit of the size which can be handled. The component named is part of an engine used for driving mining machinery and owing to the fact that plant of this nature is invariably subjected to heavy duty, frequently running for weeks without a stop, breakdowns from fatigue or other reasons are fairly numerous.

In instances when machinery is used only for certain periods of the year it is a simple matter to overhaul and repair during the season of inactivity. In cases of this kind in particular, worn shafts are often received for building up with new metal. After subsequent machining a part so treated is indistinguishable from new so far as appearance and service is concerned and the cost is rarely more than one-seventh that of a replacement. Freightage is not a heavy item and the import duty on parts sent for repair is refunded when the goods are re-exported.

An important reason why the question of a welded repair is being considered by more and more overseas users in preference to a replacement part is because this method occupies less time that would be required to obtain delivery of a new component.

Another reason for the confidence which is being placed in modern welding is the fact that engineers specializing in the latest scientific process are prepared to guarantee the results of their work on a " no cure no pay basis."

Telephone Progress

Inauguration of direct telephone service between Shanghai and the United States is forecast by the American Telephone and Telegraph Company as soon as certain replacements occur in the Shanghai technical equipment. The equipment for the United States' end of the line has been completed and proved successful in numerous tests. Shanghai, however, is not yet fully prepared to commence service on a permanent commercial basis. Service on the Hsuchow-Nanking-Shanghai Long Distance Telephone Line, which is part of the nine-province long distance telephone network for China, has been inaugurated. Important cities served include Chinkiang, Soochow and Wuhu, besides Shanghai and Nanking.

The Manufacturing Industry of Japan

As England is the foremost manufacturing country in the West, so is Japan in the East. Both these states are active in the markets of the world, the former as a matured industrial nation and the latter as a rising industrial country. Therefore, an outline of the manufacturing industry of Japan based on statistics taken in 1924 and 1930, when industrial censuses were taken in England, may be of interest to the West.

Contrast with Agriculture

It was just after the World War, when the foundation of the national economy of Japan was shifted from agriculture to manufacturing and commerce, that Japan made her début as a rising industrial country. Since then the manufacturing industry of Japan has made steady progress and nowadays ranks first in Japan proper, as indicated by the following figures :—

Table I.—Output of the Principal Industries

(Unit, 1,000,000 yen)

	1924	*1930*	*1932*
Agriculture	3,720	2,144	2,271
Stock-raising	199	192	169
Forestry	245	217	205
Aquatic products industry	521	422	372
Mining industry	351	563	512
Manufacturing industry	5,123	6,031	6,058
Total	10,159	9,569	9,587
Index-number of prices ..	217.3	143.9	128.1

Note :—The above figures are obtained from reports of the Department of Finance. The index-numbers of prices were compiled by the Bank of Japan with July, 1914, as 100.

These figures show the decline of farming and the rise of manufacturing during the years between 1923 and 1932. Out of the total for all industries, the percentage for agriculture decreased from 36.6 per cent to 23.7 per cent, while that for manufacturing increased from 50.4 per cent to 63.2 per cent. According to the 1930 census, the percentage of the population engaged in agriculture was about 50 per cent of the whole, while that in manufacturing was only about 20 per cent. This shows that the Japanese farmers, who comprise half the whole population, met with a setback owing to the scarcity of arable land and other factors. The conflict of interests between industrial centers and rural communities has been deepened year after year. This conflict is one of the grave problems in the economic life of Japan.

Progress of Manufacturing

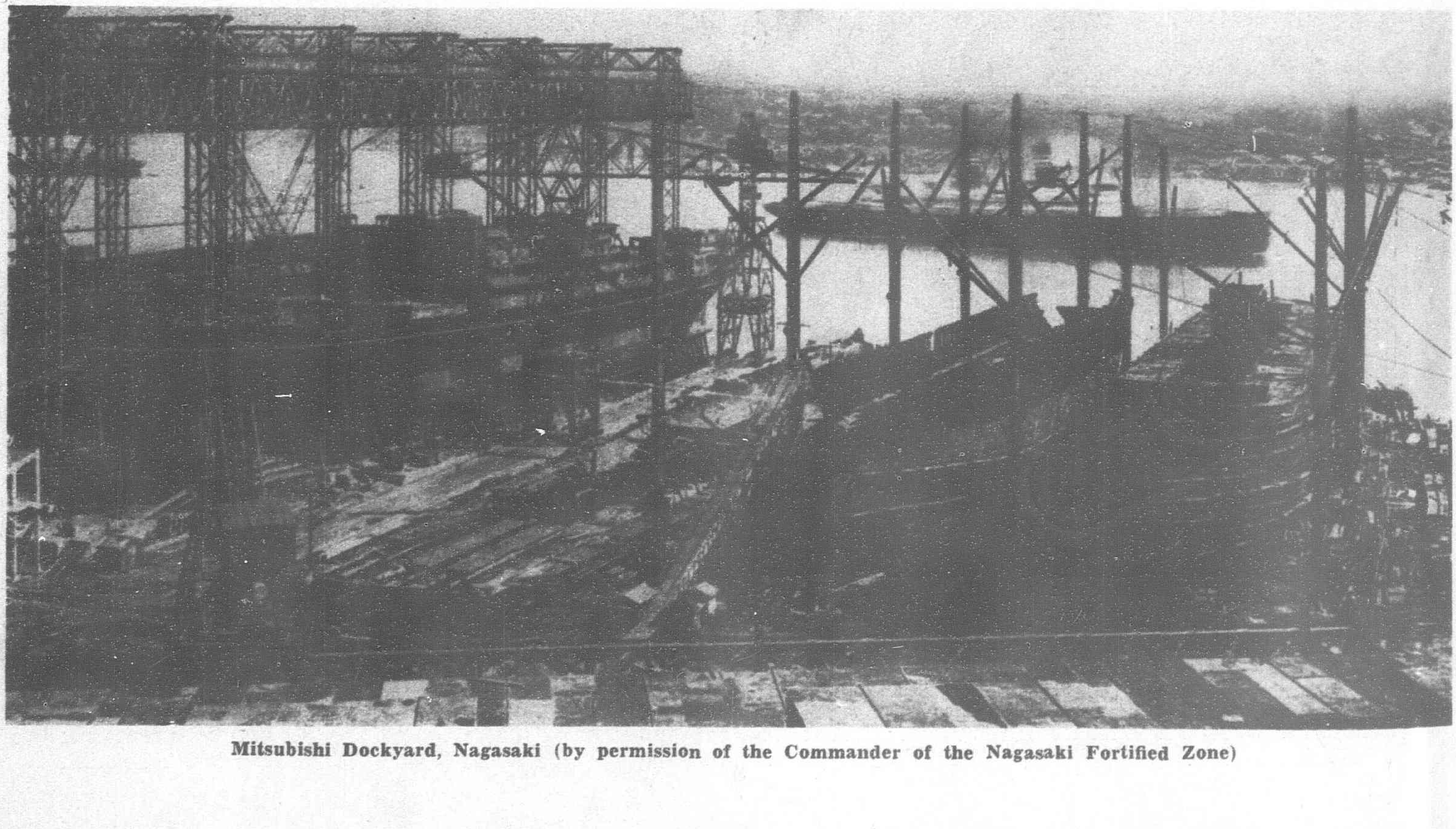
Although amalgamation, readjustment and combing-out of factories was effected in consequence of the earthquake and other disasters and the world business depression since the World War, the number of factories has increased steadily year after year. The number of industrial workers decreased after the peak year of 1928 with 1,936,000 workers, but it has increased since 1932. The recent increase in the number of workers in spite of the world business depression may be explained by the fact that the manufacturing industry of Japan is young.

Table II.—Factories, Workers and Output

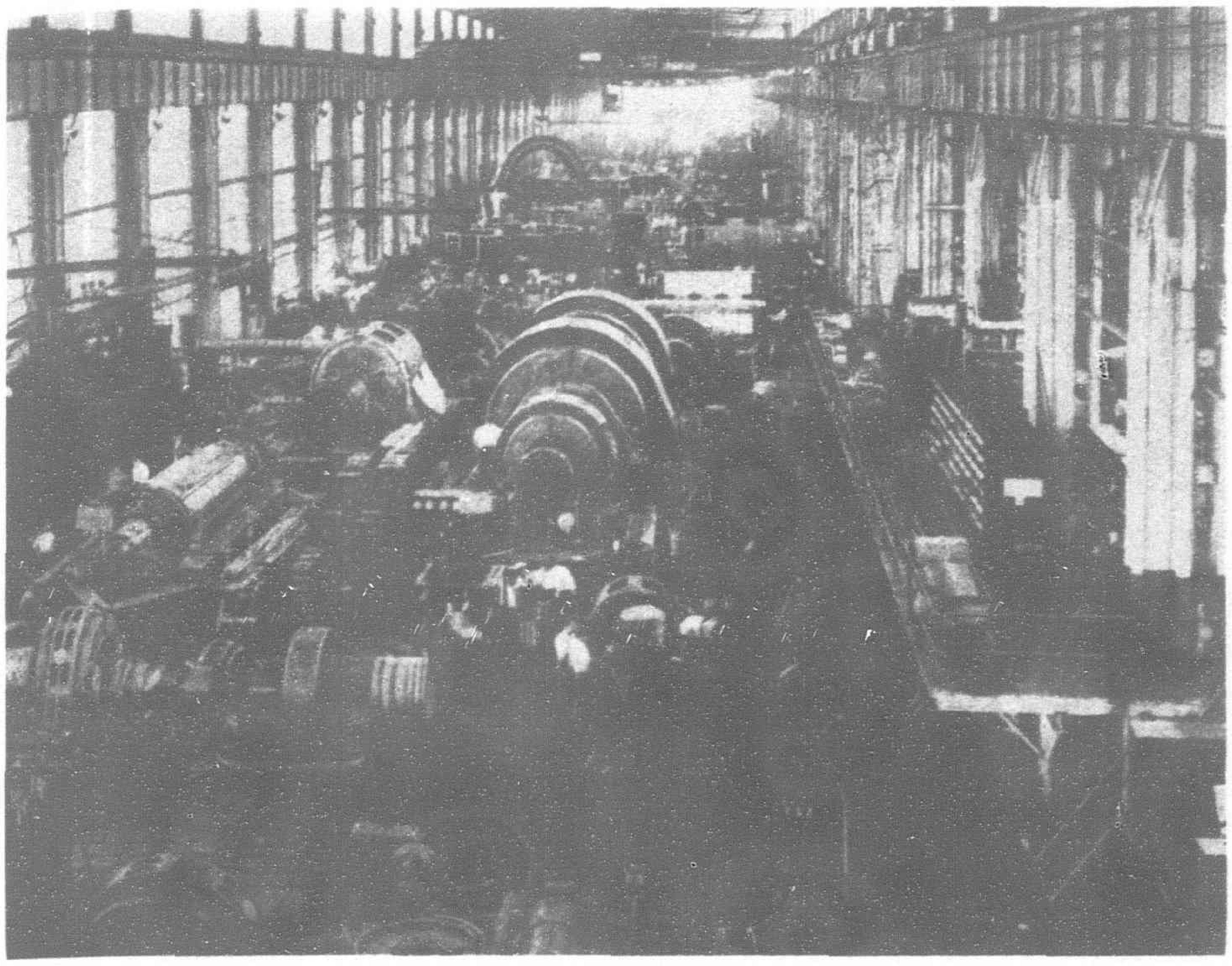
	1914	*1919*	*1924*	*1930*	*1932*
Number of factories ..	31,717	44,087	48,394	62,234	67,317
Number of workers ..	910,000	1,520,000	1,789,000	1,683,000	1,733,000
Output (000,000 yen omitted)	1,310	6,470	6,517	5,963	5,982
Index-number of prices ..	99.5	248.2	217.3	143.9	128.1

Note :—With the exception of the index-numbers, the above figures were compiled by the Department of Commerce and Industry. The difference in the total for output in the above table and the preceding table is due to authorities being different.

The development of the manufacturing industry in Japan is said to be one of the wonders of the world. But the development until 1919 was a development in light industry. Although the World War gave an impetus to the progress of heavy industry and the chemical industry, with the restoration of peace such progress was checked, due to the free trade policy and the resumed activities of European and American countries. Industrial imperialism, especially the adoption of the policy of bloc economy in the industrial countries of the West, brought a stress into the economic life of Japan, and the stress seemed to keep up with increased force. Japan was compelled to give up her policy of light industry and free trade. For the maintenance of her economic life, she was forced to adopt a policy of moderately protected



Mitsubishi Dockyard, Nagasaki (by permission of the Commander of the Nagasaki Fortified Zone)



A 62,500 kva turbo-generator under construction in an Electric Machinery works in Japan

trade and autarchy. Thus a positive development of heavy industry and the chemical industry was vigorously carried out. This proved an epoch-making development for industrial Japan. The following table compiled from reports of the Bank of Japan, shows the situation in outline.

TABLE III.—THE AMOUNT OF CAPITAL INVESTED IN NEW FACTORIES AND EXPANSION OF OLD FACTORIES

(Unit, 1,000,000 yen)

	1931	*1932*	*1933*	*1934 (Up to November)*
Amount	271	181	368	485

PERCENTAGE OF INVESTMENT IN DIFFERENT INDUSTRIES

	1931	*1932*	*1933*	*1934 (Up to November)*
Dyeing and weaving ..	7.4%	7.2%	22.6%	15.3%
Chemical	33.2	41.4	46.5	40.8
Metal	0.7	—	1.6	14.6
Mechanical engineering ..	8.7	42.5	10.6	13.2
Others	50.0	8.9	18.7	16.1
Total	100.0	100.0	100.0	100.0

The rationalization of industry occasioned by the earthquake and other disasters and the world-wide business depression, and the birth of Manchoukuo, have stimulated the development of the Japanese manufacturing industry.

With the exception of raw silk reeling, all the light industries, such as cotton spinning and textile manufacturing, have been rationalized to reduce costs and increase competitive power in world markets. And taking advantage of the low exchange rates, they are pushing ahead in overseas markets. The silk reeling business has not been paying of late and is detested by financiers because it has been shut out by the rayon industry and, due to its nature, cannot make great use of mechanical devices. But it has its own advantages. Sericulture is a profitable occupation subsidiary to farming. So its abandonment by farmers is almost impossible. To save the silk industry from ruin and increase profit, the improvement of the quality of raw silk, the marketing of finished goods in place of semi-finished goods, and the production of choice silk fabrics of all sorts have been planned and put into practice of late. The production of the very best raw silk and the export of quality silk fabrics have gradually increased.

The rationalization of industry in Japan was carried out thoroughly to meet the recent situation created by the world business depression and depreciation of Japanese currency in foreign exchange. The following table shows how the thoroughness of industrial rationalization lowered costs of production. The increase of costs in 1934 is said to be due to a rise in wages caused by the inflation boom.

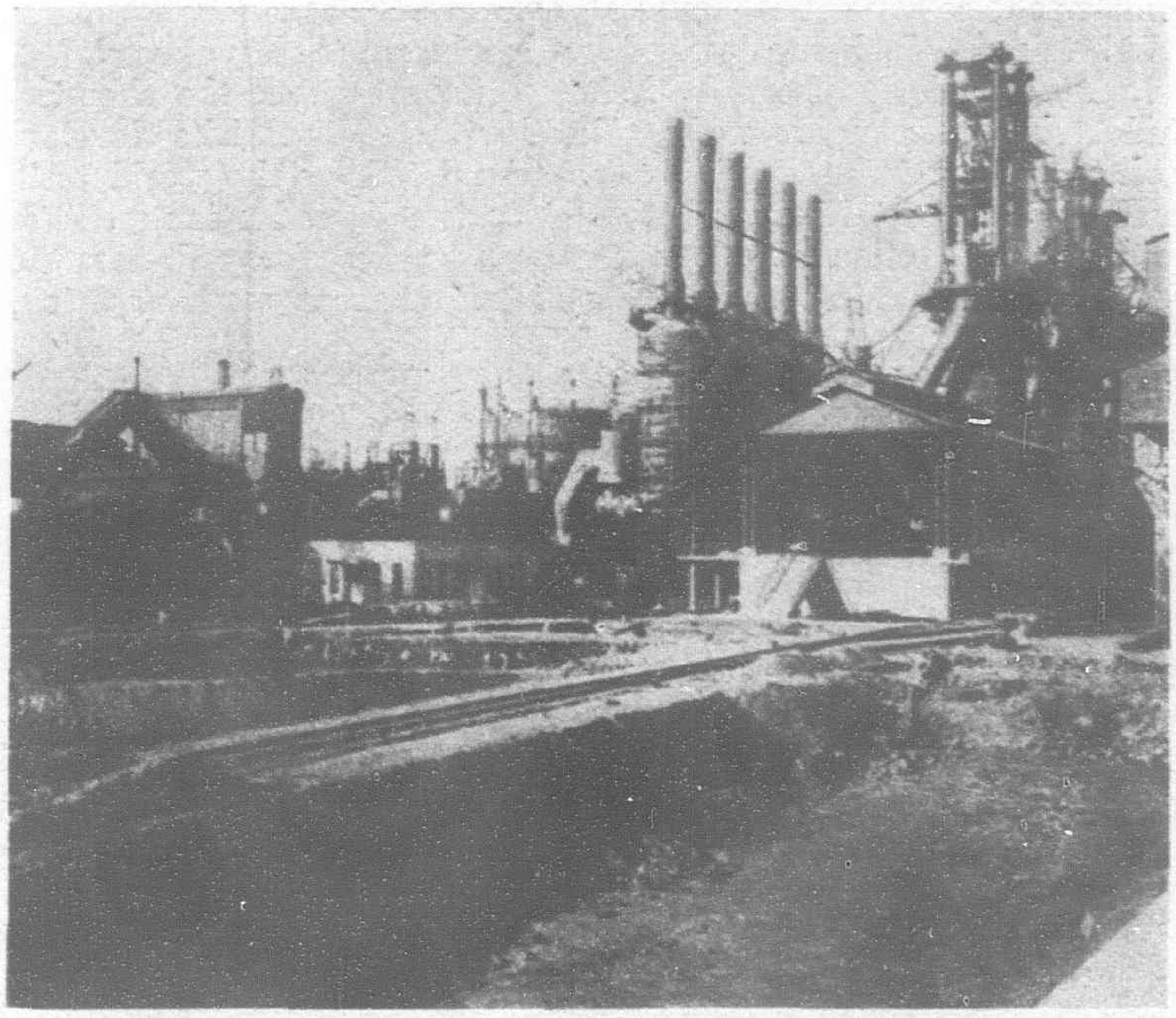
TABLE IV.—COSTS OF PRODUCTION IN THE PRINCIPAL INDUSTRIES

Units	*Cost*	*Index-numbers of cost*			
	1929	*1929*	*1931*	*1933*	*1934*
Cotton yarn One bale of 20 counts ..	Y. 40.00	100	70	63	63
Rayon 100 pounds of 120 deniers ..	113.80	100	49	29	31
Raw silk 100 *kin* ..	344.00	100	59	34	34
Woollen yarn One pound	0.42	100	67	64	71
Steel ingots One kilogramme ..	14.28	100	71	83	95
Coal One kilogramme	4.48	100	80	74	08

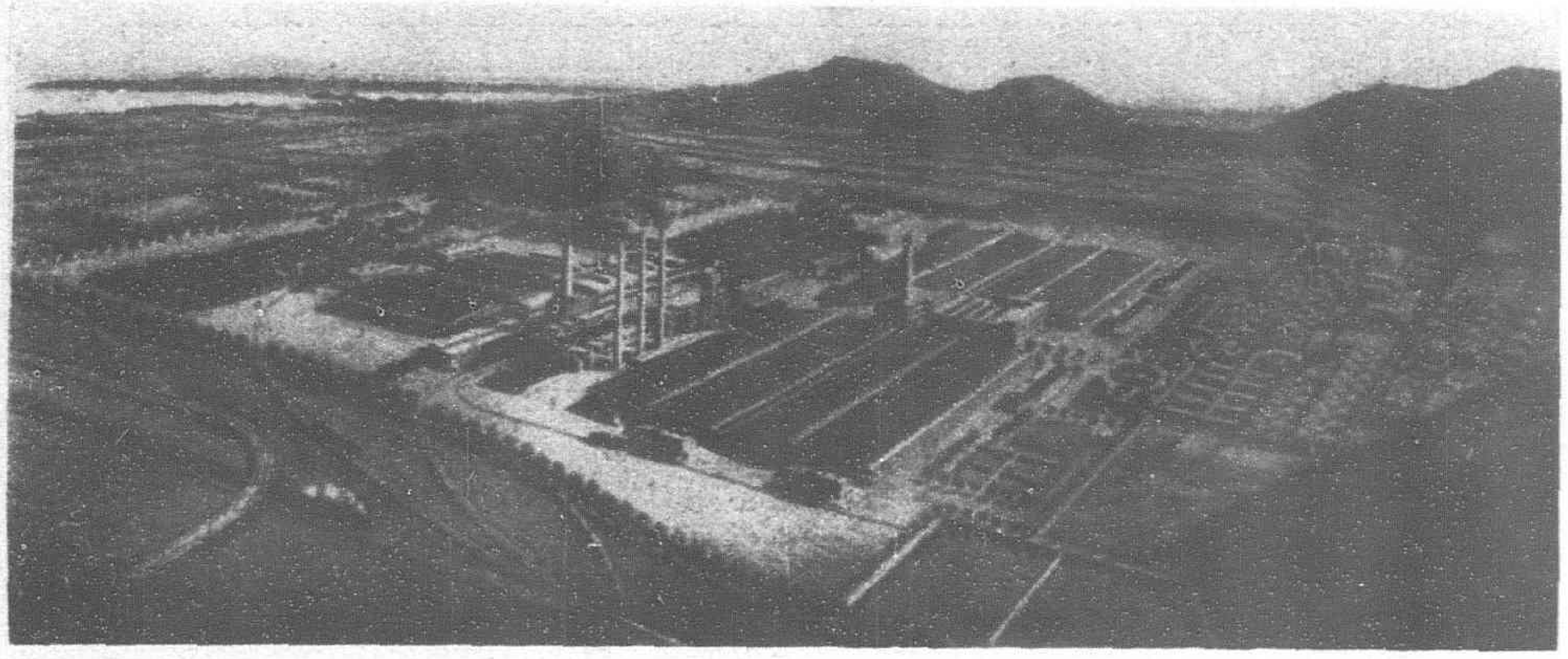
Meanwhile, it cannot be denied that the low exchange rate of the yen has stimulated the development of the Japanese manufacturing industry. As the establishment of an exchange equilibrium fund will not be realized in the near future, considering the present financial situation, Japan has to let the exchange rate take its natural course. Until the equilibrium fund is established, the effect of the low exchange rate on industry will continue.

Substance of the Industrial Development

The value of the output of the spinning and weaving industries in 1919, the year the basis of Japan's national economy was shifted from agriculture to industry and commerce, was 46.4 per cent of the total value of the output of all the manufacturing industries, but it decreased to 33.9 per cent in 1932, while the value of the output of the metal, machinery, implement and chemical industries rose to 33.3 per cent in 1932, from 27.5 per cent in 1919. At the same time, as seen in Table V, the total value of the output of the latter group of industries increased from Y.1,831,000,000 to Y.2,092,000,000, while that of the spinning and weaving industries decreased from Y.3,206,000,000 to Y.2,028,000,000. This fact shows the decline of the spinning and weaving industries and the conspicuous rise of heavy industry. The slump in the price of raw silk might be counted as one of the factors in the decline, but it cannot be denied that the spinning and weaving industries have been waning of late.



Blast furnaces at the Yawata Steel works of the Nippon Iron Manufacturing Company (by permission of the Commander of the Shimonoseki Fortified Zone)



A Great Modern Rayon Plant in Western Japan

TABLE V.—VALUE OF THE OUTPUT OF THE PRINCIPAL INDUSTRIES

(*Unit, 1,000,000 yen*)

Industries	*1919*	*1924*	*1930*	*1932*
Spinning and weaving	3,296	2,925	2,078	2,028
Metal	338	370	526	591
Machinery and implement	716	446	616	544
Cement	175	181	159	160
Chemical	777	729	924	957
Lumber	158	181	158	153
Printing and book-binding	66	147	180	168
Food	741	1,082	950	886
Others	202	210	194	233
Finishing and repairing	201	237	229	263
Total	6,670	6,518	5,963	5,983
Index-number of prices	248.2	217.3	143.9	128.1

Note :—Figures compiled by the Department of Industry and Commerce and for Japan proper alone.

The spinning and weaving industries of Japan developed marvelously and enjoyed great profits. But recently Japanese textile goods have become the target in the tariff war of the world. Therefore, the spinning and weaving industries are doomed if they keep up their old methods of trade. As devices to meet the foreign attack, various schemes have been formulated. In cotton yarn and fabrics manufacturing, the expansion of equipment for mass production and the fitting up with reserve funds of equipment for rayon, staple-fibre and woollen production as side-jobs have been devised. It is said that now is the time for the establishment of such subsidiaries. The limitation of such side-jobs to the fibre industry is explained by the fact that there it offers the least risk in allied businesses and that for sales, long established agencies may be profitably employed. In Japan the woollen industry has developed, so that it is now not only producing enough woollen cloth to meet the home demand but has begun to ship abroad.

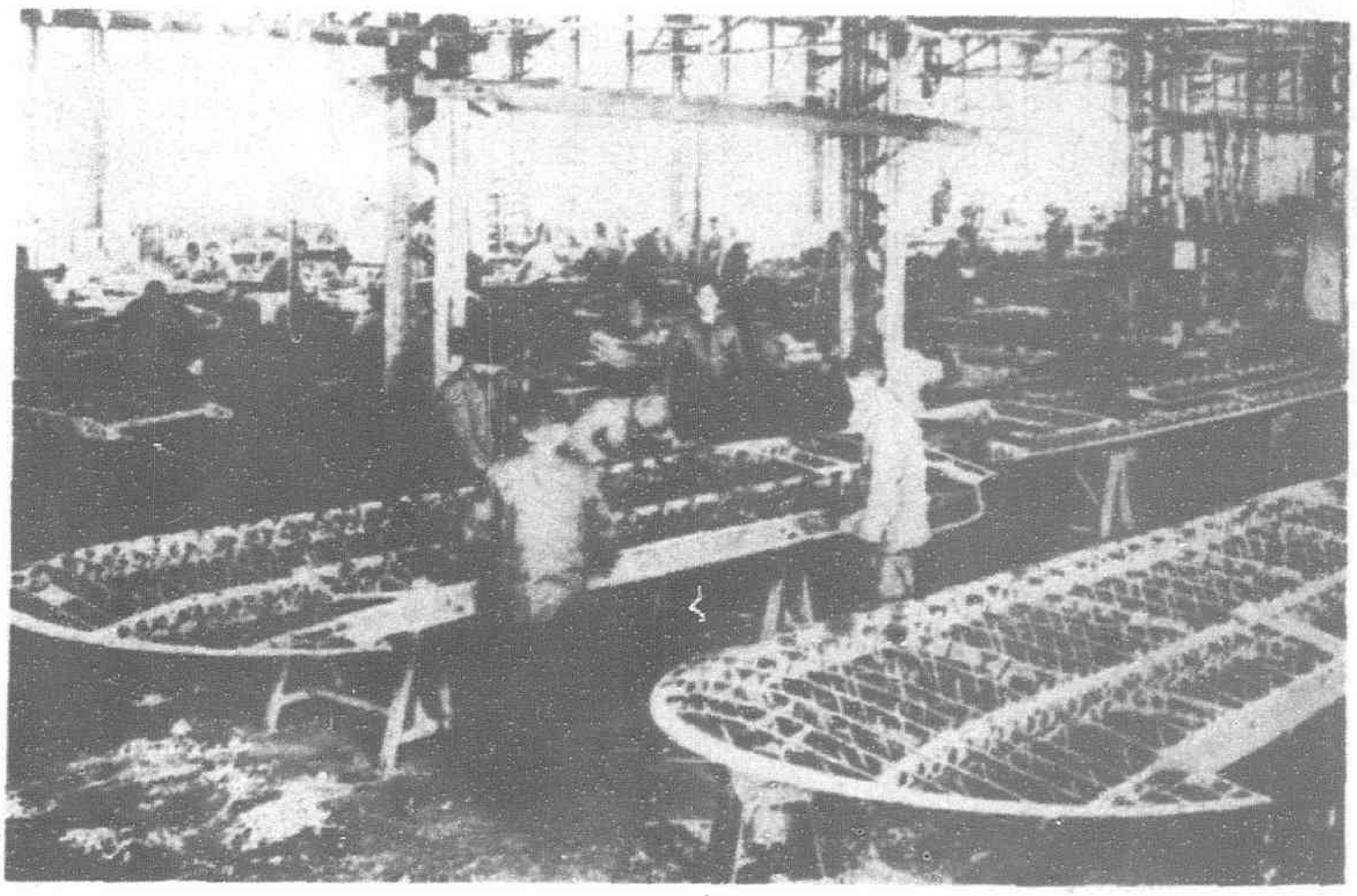
As stated elsewhere, both heavy industry and the chemical industry of Japan are making headway steadily. The development of these industries has been stimulated by the world tariff war. In the metal industry, the expansion of production facilities and the production of alloys has been pushed forward. In the sphere of mechanical engineering and implement manufacturing, the facilities for shipbuilding and rolling-stock and motor manufacturing have become complete. Mass production of aeroplanes and motor-cars has been started of late. In the light chemical industry, celluloid and rubber goods, and pulp and rayon yarn are produced for the foreign demand in great quantities. In the heavy chemical industry, the progress in the manufacture of chemical fertilizers has been remarkable.

Equipment and Facilities

It needs not be said that the scale of industrial equipment and facilities is in keeping with the economic requirements of each industry, but generally speaking, the new industries recently introduced into Japan are managed on a large scale and the native industries on a rather small scale, with some exceptions. In 1932, there were altogether 67,317 factories and 1,733,000 workers throughout Japan proper, with a total production worth Y.5,982,000,000. These factories are classified below according to their equipment :—

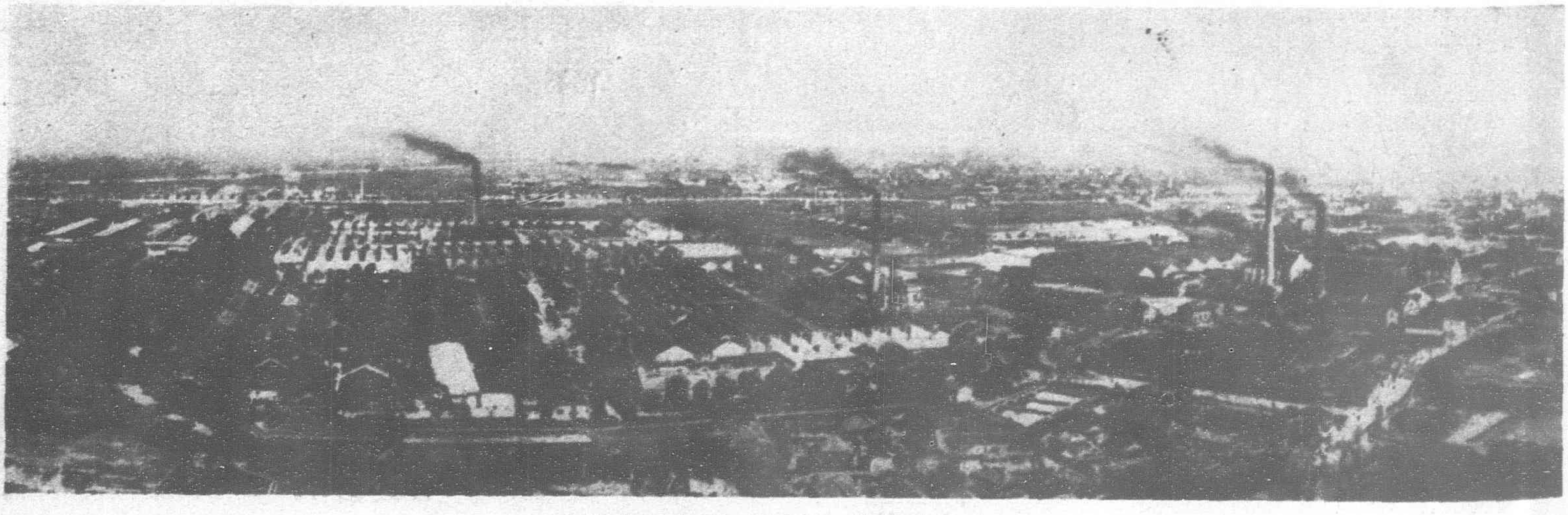
	Percentage of factories	*Percentage of workers*	*Percentage of production*
Large factories	1.8%	39.3%	44.8%
Medium factories	12.4	30.9	31.9
Small factories	85.8	29.8	23.3

Note :—A factory with from five to 29 workers is called a small factory, a factory with from 30 to 199 workers a medium sized factory, and a factory with 200 or more workers a large factory.



Working on wings in a Japanese Airplane Factory

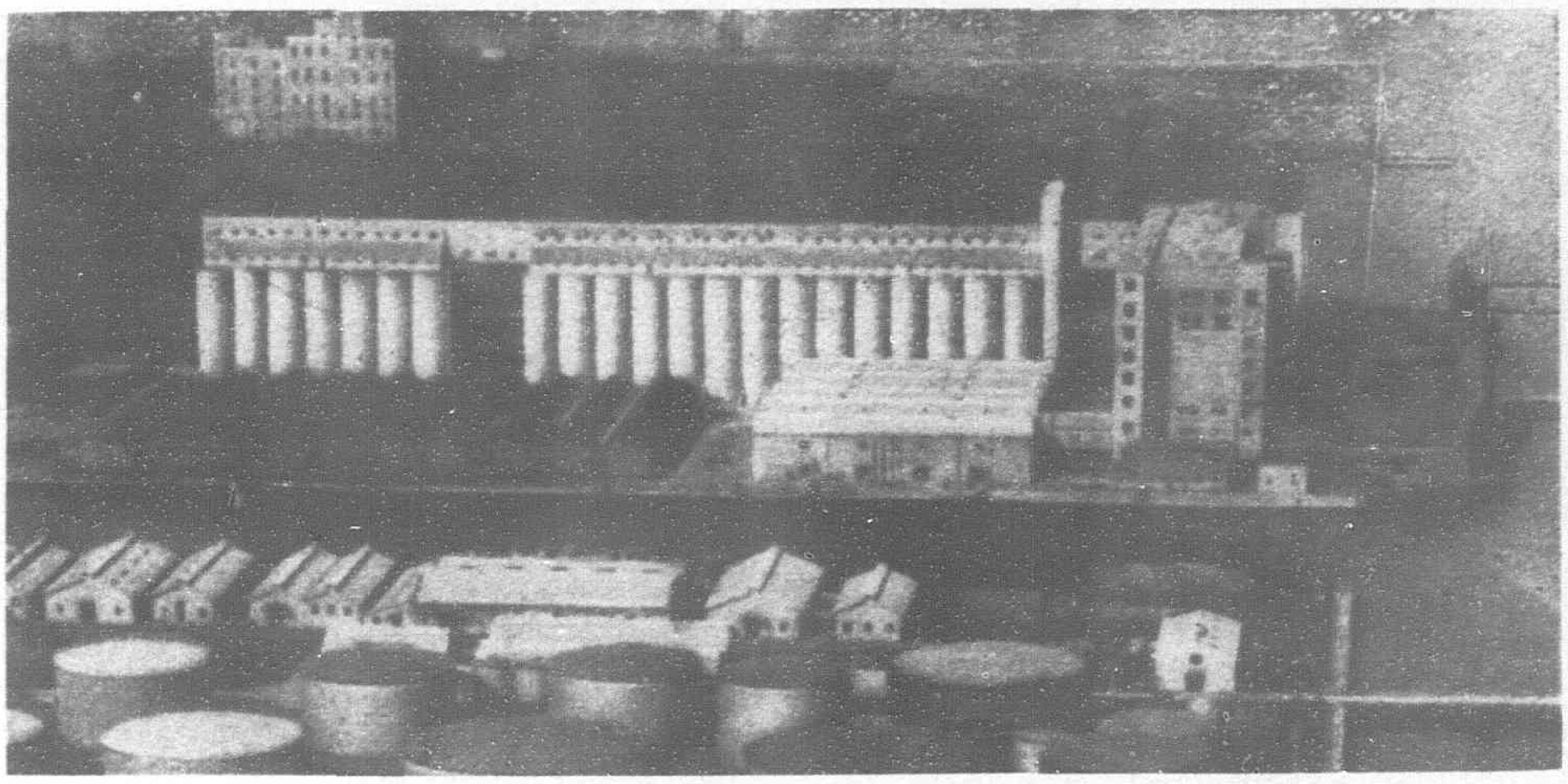
As will be seen by the above table, small factories outnumber large, the number of workers in nearly the same in the three categories, and in production the large factories are dominant. The average production per factory increases in geometrical progression in accordance with size, as shown in the following



A Cotton Textile Finishing Mill at Osaka table. This may be attributed to mechanization of equipment as a whole, there being no difference in production capacity in the workers in large and small factories.

	Production per factory	*Production per worker*
Large factories	2,240,000 yen	3,944 yen
Medium factories	229,000	3,563
Small factories	24,000	2,689
Average	89,000	3,452

The industries run on a large scale are the spinning and weaving, chemical, mechanical engineering, implement and cement industries, and those run on a small scale are the food, lumber, furniture, and printing and book-binding industries. As shown in the following table, the large-scale industries that produce heavily are the gas and electricity, spinning and weaving, mechanical engineering, implements, metal, cement and chemical industries, and the small-scale industries with a large output are the food, lumber and furniture industries.



A Modern Japanese Flour Mill in Kanagawa Prefecture

TABLE VI.—SIZE OF FACTORIES OF VARIOUS CATEGORIES

(*In percentages of total number of factories*)

Industries	*Large scale*	*Medium scale*	*Small scale*	*Total*	*Distribution*
Spinning and weaving	3.7%	18.5%	77.8%	100.0%	31.6%
Metal	1.2	10.8	88.0	100.0	6.9
Mechanical and implements ..	1.8	11.3	86.9	100.0	10.0
Cement	1.0	12.8	86.2	100.0	4.8
Chemical	2.6	21.8	75.6	100.0	5.5
Lumber and furniture	0.1	6.7	93.2	100.0	8.2
Printing and book-binding ..	0.7	10.7	88.6	100.0	4.4
Food	0.7	4.5	94.8	100.0	18.9
Gas and electric	1.0	7.3	91.7	100.0	0.8
Others	0.6	9.3	90.1	100.0	0.9
Average	1.8	22.4	85.8	100.0	100.0

PERCENTAGE OF TOTAL NUMBER OF WORKERS

Industries	*Large scale*	*Medium scale*	*Small scale*	*Total*	*Distribution*
Spinning and weaving ..	50.4%	30.6%	19.0%	100.0%	50.9%
Metal	31.7	30.6	38.7	100.0	5.6
Mechanical and implements ..	48.7	24.4	26.9	100.0	11.2
Cement	20.3	43.2	36.5	100.0	3.6
Chemical	41.1	38.1	20.8	100.0	7.8
Lumber and furniture	2.8	31.4	65.8	100.0	3.5
Printing and book-binding ..	17.0	36.6	46.4	100.0	3.0
Food	7.2	24.2	68.6	100.0	7.9
Gas and electric	16.5	31.3	52.2	100.0	0.5
Others	19.8	35.6	44.6	100.0	6.0
Average	39.3	30.9	59.8	100.0	100.0

PERCENTAGE OF TOTAL PRODUCTION

Industries	*Large scale*	*Medium scale*	*Small scale*	*Total*	*Distribution*
Spinning and weaving	59.5%	24.8%	15.7%	100.0%	37.0%
Metal	49.4	28.2	22.4	100.0	9.9
Mechanical and implements ..	57.0	26.0	17.0	100.0	10.0
Cement	44.0	40.1	15.9	100.0	2.7
Chemical	43.4	39.0	17.6	100.0	15.7
Lumber and furniture	3.7	39.4	56.9	100.0	2.6
Printing and book-binding ..	37.6	39.0	23.4	100.0	3.0
Food	14.2	41.5	44.3	100.0	14.9
Gas and electric	60.3	28.1	11.6	100.0	0.2
Others	21.1	42.7	36.2	100.0	4.0
Average	44.8	31.9	23.3	100.0	100.0

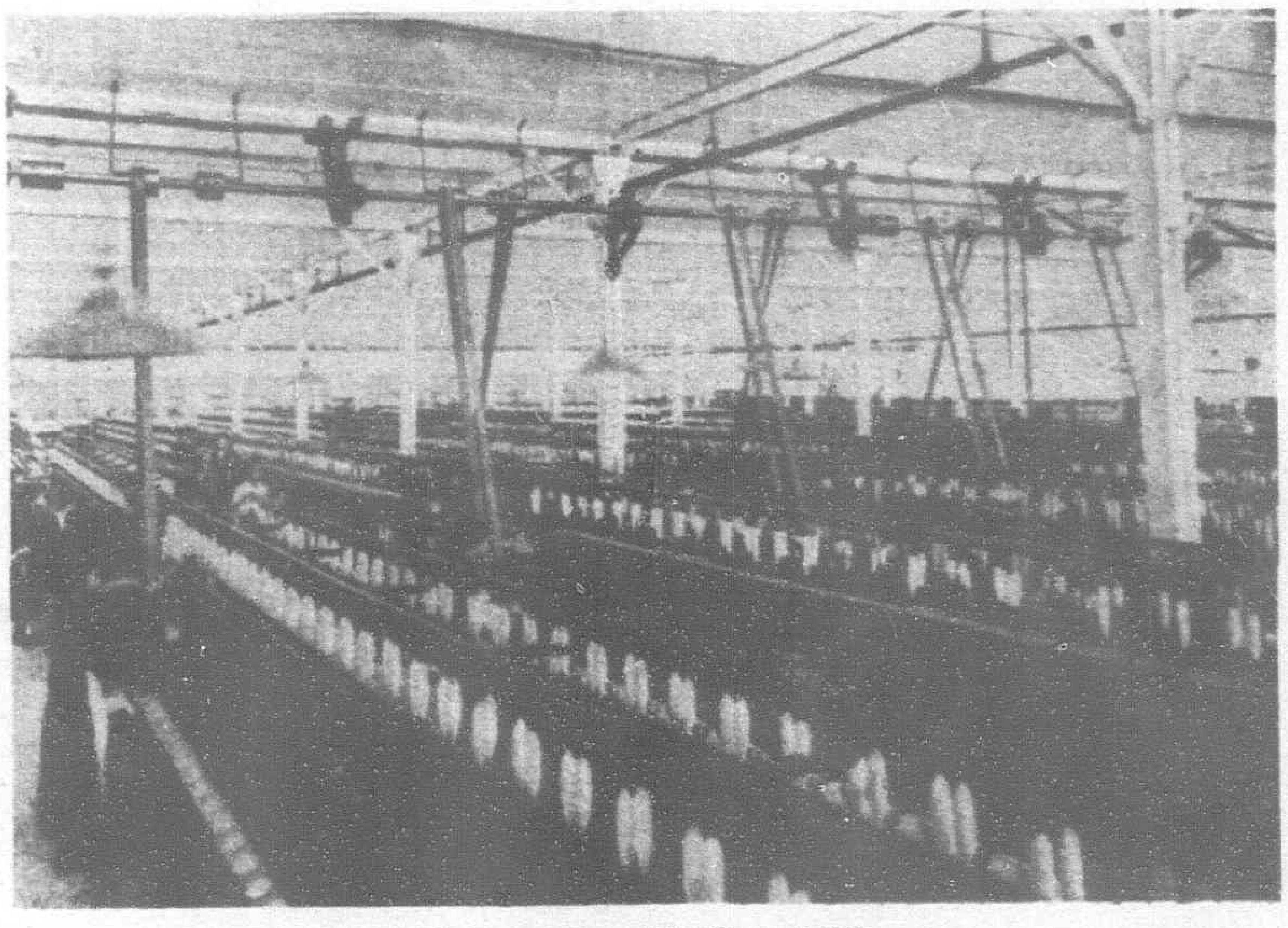
Note :—The above figures are from statistics compiled by the Department of Commerce and Industry.

Trade Associations

In Japan, the manufacturing industries on a medium and small scale cannot be ignored because 98.2 per cent of the factories, 60.7 per cent of the workers and 55.2 per cent of the output are theirs, and these industries are progressing as a whole. The drawbacks in the management of such factories are : (1) owing to lack of organization and production arrangements, uniformity of products cannot be secured and often inferior articles are produced, (2) due to lack of efficient sales agencies, they are easily exploited by jobbing merchants, (3) as they are short of funds and their credit is limited, they are handicapped in money matters, and (4) there is a lack of regulations covering production and marketing. To do away with these drawbacks, the regulation of manufacturers' associations has recently been undertaken. In accordance with the regulation, government subsidies are granted for co-operative arrangements in production and low rates of credit are extended by the Deposit Bureau of the Finance Department to free industrialists of small means from exploitation by jobbing merchants, to raise the market price of their products and to better the conditions of labor employed by them.

The characteristics of the industrialists of small means are specialization in lines of production, operation with limited credit and production of goods to order. They are forced to manufacture cheap goods or to secure orders under pressure, and therefore, there is no reasonable profit, because all their funds being invested in fixed assets, they have to rely upon jobbing merchants or parent companies to obtain working funds. Under such circumstances, the securing of orders is a vital question for small factories. And as they need no special technique or skilled labor, it is easy for novices to start in business. This increases the number of people in the same lines and invites unfair competition among them, a fall in wholesale prices and eventually the production of coarse goods, causing damage to their reputation at home and abroad and a deterioration in labor conditions.

To make good these deficiencies by legislation, the regulation of associations of manufacturers of the principal products and of industrial associations was undertaken long ago. But as in the former case it was negative, aiming mainly at the examination of products, and in the latter not practical, the regulations adopted were of little use. Not satisfied with the prevailing situation, the government authorities devised new regulations for the associations of manufacturers of the principal export goods in 1925. The sphere of these regulations was extended in 1931, to include associations of manufacturers of the principal goods for home consumption. These regulations, at present in force, aim at the promotion of productive activities, the financing of the members



A Japanese Woollen Mill

of manufacturers' associations and the development of each manufacturing industry as a whole. According to the regulations, the manufacturers' associations may (1) examine the materials, products and factory equipment of their members, and regulate the management of factories, (2) specify or sell goods produced by members, supply members with trade necessaries, set up factory equipment for the common use of members and make other arrangements for them, (3) lead members in the promotion of their trade and study and do research work in connection with their trade, and (4) loan necessary business funds to members and hold their savings. By these regulations, the industrial associations aim at correction of the defects of small-scale manufacturing, improvement of products and rationalization of business transactions by the examination of products, regulation of output, joint specification of goods, joint purchase of materials and finished goods, and financial assistance.

The presence of large-scale manufacturers and the activities of non-members are the greatest obstacles in the way of the associations. It is hard to organize joint trade associations of small-scale manufacturers and large-scale manufacturers. But they have to co-operate. According to the regulations, the small-scale manufacturers can organize a federation of trade associations on an equal footing with large-scale manufacturers.

As the association of manufacturers is a voluntary corporation to be established with funds contributed by its members, it cannot compel industrialists to join. Therefore, the activities of non-members often prove detrimental to the joint activities of the members. So the Minister of Commerce and Industry is authorized to order non-members engaged in manufacturing in districts where associations exist, to follow the regulations or limitations formulated by any manufacturers' association whenever he sees fit. As this is, however, an infringement upon freedom of trade by individuals, it is not easily applicable. Up-to-date altogether only nine cases involving twelve associations have been reported.

At the end of 1934 the associations of manufacturers in the following lines had been established in accordance with the regulations, most of them being local associations and the rest national: —striped damask, cotton crape, cotton flannel, toweling, printed narrow cotton cloth, other cotton goods, habutae, silk-dyeing, other silk goods, woollen, hemp-cloth, rayon fabrics, rayon-dyeing, other rayon goods, socks and stockings and other knitted goods, filament, bicycles, watches and clocks, electric bulbs, ceramics, tiles, earthenware pipes, matches, rubber shoes, rubber tryes, rubber belts, celluloid goods, ice, biscuits, phosphate-manure, writing ink, enamelled ware, glass ware, lacquer ware, toys, braids, buttons, brushes, caps and hats, pencils, cultured pearls, rock-crystal articles, wooden and bamboo ware, matting, millet-jelly and glucose, insect-powder and allied articles, lime, medicines, weights and measures, *papier-mache* and *papier-mache* ware, tinned and bottled foods, leather and leather goods, soft-drinks, bread, pouches, soy, soap, bricks, starch, internal combustion engines and others. The total number of associations was 221 and there were fourteen nation-wide federations of associations, in the following lines: cotton-fabrics, toweling, printed narrow cotton cloth, habutae, silk dyeing, rayon dyeing, bicycles, electric bulbs, ceramics and earthenware, rubber goods, enamelled ware, braids, pencils and cultured-pearls.

These associations and federations of associations are engaged in curtailment of production, direction of specifications, oversight of materials and enforcement of joint purchases on the production side and price-fixing, designation of customers, demarcation of markets and enforcement of joint sales on the sales side. Their activities have proved profitable for the members. Small-scale manufacturers were benefited the most. They were freed from exploitation by wholesale dealers and jobbing merchants.

While small-scale manufacturers were thus freed from long-standing evil practices and set on the way to positive development, they had to encounter a new phase of labor trouble. Formerly workers employed at small factories were not organized and were content with the care and friendliness of their employers. But seeing the prosperity of their employers, they began to demand not only higher wages but also the promotion of their general welfare. Whenever there was a chance they left small factories for large factories with better welfare arrangements, and this caused a scareness of labor and high wages in small factories.

According to the reports of the Nippon Kogyo Club (Japan Industrialists' Club), the average amount spent per laborer on welfare measures in the first half-year of 1931 was Y.115 the maximum per head being Y.327 for sailors and the minimum per head Y.37 in sundry occupations. The labor welfare measures are explained by the following table:—

TABLE VII.—PERCENTAGE OF LABOR WELFARE COST

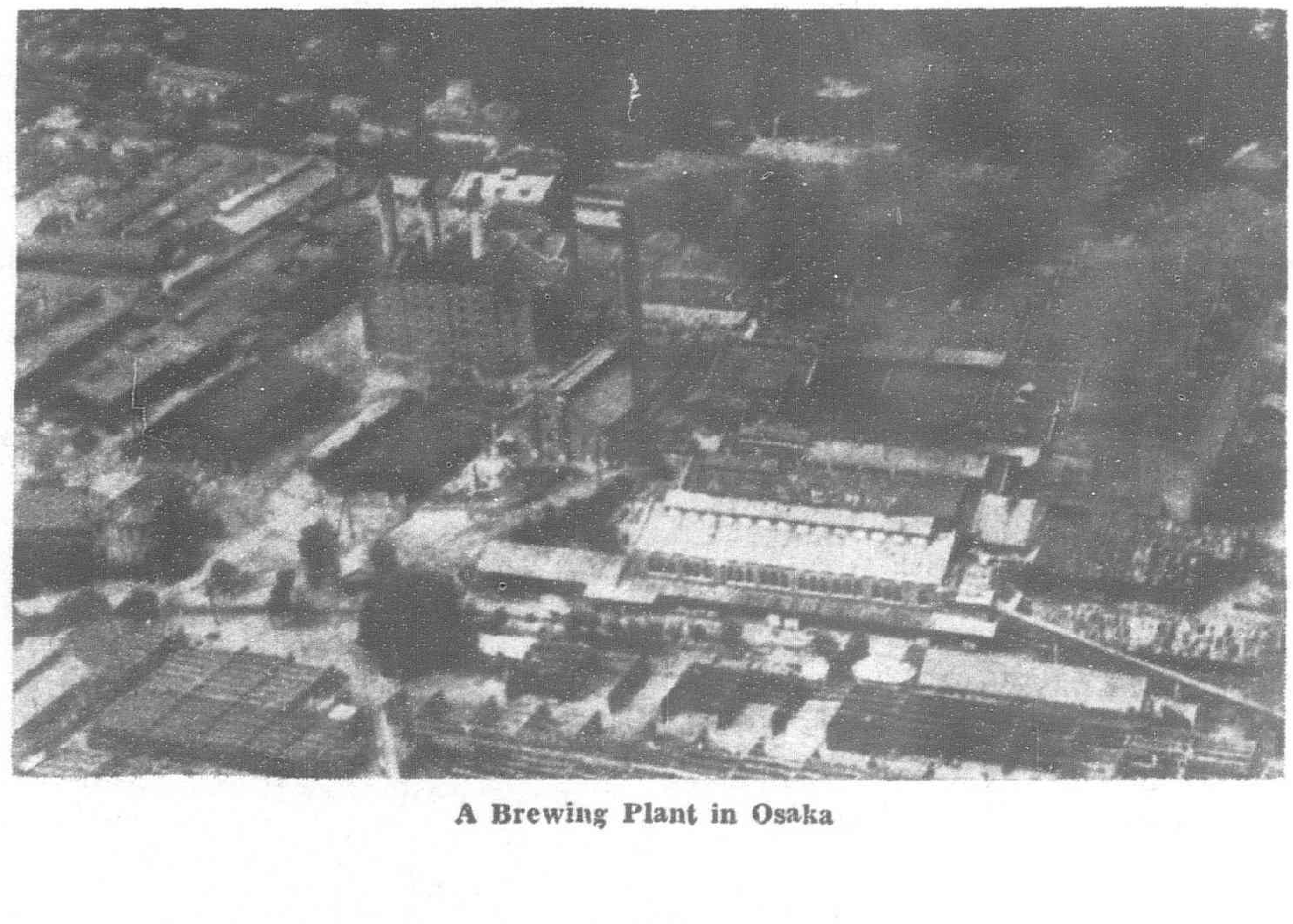
(*Average*)

	First half-year 1926	*First half-year 1930*	*First half-year 1931*
Housing or room and board ..	14.6%	14.8%	14.5%
Every day necessaries	19.4	3.6	3.4
Hygienics	17.4	7.8	7.5
Safety devices	—	1.3	1.3
Relief work	3.6	1.6	1.8
Cultural items	2.9	3.1	3.1
Entertainments	4.4	2.1	2.2
Extra allowances	32.1	62.6	63.2
Office expenses	3.0	2.2	2.1
Others..	2.6	0.9	0.9
Total	100.0	100.0	100.0

The largest item in the welfare costs is "extra allowances" and next comes "housing" and "every day necessaries." In large factories there are company stories or co-operative stores for the supply of every day necessaries such as sweets, soft drinks, clothing, toilet goods and other articles at low prices. The price of these articles is generally the purchase price plus five per cent for running expenses, and whenever there is a profit at the half-yearly settlement of accounts, it is usually spent on an athletic meet. As mentioned elsewhere, small-scale manufacturers are compelled to invest almost all their capital in production arrangements with little left for running expenses, so it is hard for them to build and maintain company houses, dormitories, and well equipped company stores. Therefore, the proprietors of small factories in which the operation of machines is simple or very little machinery is in operation move their factories from expensive industrial districts to villages where they can employ cheap labor. This tendency is marked of late. The government authorities are planning the industrialization of rural districts as a farm relief measure. If such plans are put into practice extensively, the shifting of small factories from cities to villages will be vigorously stimulated.

Cartel Movements

One of the most remarkable industrial phenomena of Japan is the progress of the cartel system. The cartel system in Japan was established to meet the world business depression after the



A Brewing Plant in Osaka

World War, and it has developed rapidly under the law for controlling important industries promulgated in 1931. As shown in Table VIII, the foundation of the cartel system was mainly laid by the large manufacturing companies. The features of the cartel law are as follows :—

(1) Concerns designated by the Minister of Commerce and Industry as engaged in important industries agree by government order to control both their production and sales, and when the majority of the concerns in the same line of business have joined in the agreement, they have to report the same to the Minister within the time designated by him.

(2) When it is deemed necessary for the healthy development of the national economy and protection of the fair interests of the industry concerned and more than two-thirds of the signers of the control agreement wish it, and when the committee of control agrees, all the concerns that have not yet signed the agreement, must abide by it as a whole or in part.

(3) The Minister of Commerce and Industry may repeal or modify the control agreement through the committee of control when the agreement is seemed to be against the public good or the fair interests of the said industry or other industries closely connected with it.

(4) The Minister of Commerce and Industry may inspect the business transactions of the members or non-members bound to abide by the control agreement or instruct the committee of control to report to him whenever he finds it necessary for the supervision of the agreement.

TABLE VIII.—MARKET CONTROL BY LARGE MANUFACTURING COMPANIES

	Number of large concerns	*Percentage of output of large concerns*	*Percentage of output of small concerns*
Cotton spinning..	5	52.7%	47.3%
Pig-iron	1	84.3	15.7
Pressed steel	1	44.2	55.8
Copper	5	91.3	8.7
Shipbuilding	2	73.7	26.3
Cement	2	47.6	52.4
Pulp	1	96.6	3.4
Paper	1	84.9	15.1
Rayon	6	71.1	28.9
Sulphate of ammonia	4	67.2	32.8
Beer	2	88.9	11.1
Sugar	6	93.5	6.5
Flour	2	68.8	31.2

Before the World War, production and sales in only such industries as cotton spinning, petroleum, coal, hemp, superphosphate fertilizer and sugar were controlled by agreement. But at the end of 1932, there were altogether 64 cartels in important industries including, besides the above, silk-reeling, wool, iron and steel, copper and brass, shipbuilding, pulp, nitro-lime, sulphate of ammonia, sulphuric acid, carbide, bleaching powder, oxygen, grease, carbon dioxide, flour, beer, etc. Cartels are divided into two classes, one for industries under the industry control law and the other for industries not under the law. At the end of 1932, the number of the former was 35 and of the latter 29. The cartel system is most highly developed in the chemical, spinning and metal industries. And as seen in Table VIII, the pulp and paper, beer, and iron and steel industries, not being satisfied with the cartel system, have organized trusts by amalgamating all the big companies.

TABLE IX.—NUMBER OF CARTELS

	Cartels under the control law	*Cartels not under the control law*	*Total*
Spinning and weaving	12	5	17
Metal	2	5	7
Mechanical and implement ..	—	1	1
Cement	4	—	4
Chemical	12	12	24
Food	4	1	5
Mining	1	5	6
Total	35	29	64

The total output of the industries under the cartel system in 1932, is shown in Table X. The average percentage of the output of the controlled industries against the total output was 29.3 per cent, the percentage of the mechanical and implement industry being only 8.5 per cent and of the others from 30 per cent to 40 per cent. The percentage of the output of the controlled chemical concerns in comparison with the output of the uncontrolled was from 67.5 per cent for sulphuric acid to 100 per cent for the others, with the exception of 39.2 per cent for carbide. On the whole, of the total output of all the manufacturing industries of Japan, about one-fourth is by cartels.

TABLE X.—OUTPUT OF CONTROLLED INDUSTRIES

(Unit, 1,000,000 yen)

	Cartels under the control law	*Cartels not under the control law*	*Total*	*Percentage of the output of cartels to the total output*
Spinning and weaving ..	514	261	775	38.2%
Metal	265	—	265	44.6
Mechanical and implement .	—	46	46	8.5
Cement	68	—	68	42.8
Chemical	216	90	306	31.9
Food	291	—	291	32.8
Total	1,354	397	1,741	*29.3

*(Average).

Before the World War, the cartel activities of Japan were limited to the control of sales or fixing of market prices with the exception of the cotton spinning industry, where a rigid control of production prevailed. Since the cartel law was promulgated, however, the phase of cartel movements has been entirely changed. The cartels went from price control to production control, and the manufacturers concerned, not satisfied with simple control of production, made agreements and joint sales systems to re-enforce industrial organizations.

Just before the control law was enacted, Japanese manufacturing industries were in a mess. Cut-throat competition was rampant and many concerns were ruined altogether. The principal aim of the control law was to save industries from unfair competition and to lead them on to healthy development. The protection of the manufacturers' interests was emphasized by the law. The cartel system was fostered by its enactment. But as the protection of the manufacturers' interests was over-emphasized, in due course it was taken advantage of by the manufacturers for selfish purposes, such as the monopolization of industries by large concerns and, hence, the raising of commodity prices. Recently the government authorities have shown an intention to emphasize the protection of the interests of the ultimate consumer in their application of the law. They are endeavoring to check industrial monopolization wherever they find unfair business operation by cartel. In 1934, the beer and coal trusts were restricted by the government. But it seems that the authorities have not cast away their principal aim, because in 1934, they designated the cement business as an industry to be placed under the cartel law and announced that the production of cement by non-members would be regulated equally with that by members. The term of application of the cartel law is five years. It is said that the term will be extended with some amendments to curtail monopolization in important manufacturing industries.

Investment and Profit

The exact amount of capital invested in the manufacturing industries of Japan is not known, but the number of manufacturing companies registered as joint-stock corporations, and limited or unlimited partnerships and the amount of their paid-up capital at the end of 1932, were as shown in Table XI. As seen by the table, the total amount of their paid-up capital was about two-fifths of the paid-up capital of all the industries of Japan. This means that the manufacturing industries occupied an important position in Japan.

TABLE XI.—PAID-UP CAPITAL OF MANUFACTURING INDUSTRIES

(Unit, 1,000,000 yen)

	Number of companies	*Total paid-up capital*	*Percentage of manufacturing industries to all industries of Japan*	
			Number of companies	*Paid-up capital*
1914	5,266	834	31.2%	40.3%
1919	10,112	2,249	38.4	37.6
1924	13,251	4,056	39.5	37.4
1930	18,205	5,519	34.4	39.6
1932	22,575	5,584	34.7	39.8

Percentage of Companies Classified

(At the end of 1932)

		Unlimited partnerships	*Limited partnerships*	*Joint-stock companies*
Total number of manufacturing companies ..	22,575	15.5%	52.5%	31.7%
Paid-up capital ..	Y.5,584,000,000	2.7	4.1	93.2
Reserve fund ..	853,000,000	1.4	2.2	96.4
Debentures ..	1,702,000,000	—	—	100.0
Total ..	Y.8,139,000,000			

There were far more limited and unlimited partnerships than joint-stock companies, but in capital, the latter were absolutely supreme. The distribution of companies and paid-up capital is shown in Table XII. The industries with many companies were the food, sundries, spinning and weaving and chemical industries, the industries of great capital were the electric and gas, spinning and weaving, food and mechanical industries, the industries that were operated on a large scale were the electric and gas, chemical, spinning and weaving, mechanical and implement, and cement industries, and the industries that operated on a small scale were the food, lumber, furniture, and printing and book-binding industries. The average percentage of paid-up capital was 67.7 per cent of the total, the average percentage of reserve funds 10.4 per cent and of debentures 20.9 per cent. With the exception of the electric and gas and chemical industries, almost all the industries had few debentures. The fact that spinning and weaving industries are rich in reserve funds proves that the foundation of the spinning and weaving business in Japan is firm.

Table XII.—Distribution of Funds in the Main Manufacturing Industries

	Percentage of all companies	*Percentage of total paid-up capital*	*Nature of funds*		
			Paid-up capital	*Reserve funds*	*Debentures*
Spinning and weaving	16.1%	15.2%	62.9%	26.4%	10.7%
Metal	5.2	4.9	81.1	8.1	0.8
Mechanical and implement	9.4	8.8	81.7	14.9	3.4
Cement	2.7	3.5	79.3	9.2	1.5
Chemical	9.5	12.5	68.4	10.5	21.1
Lumber and furniture	8.3	1.2	94.1	5.9	—
Printing and book-binding	4.4	0.7	88.5	9.9	1.6
Food	24.1	9.9	81.4	13.2	5.4
Electric and gas ..	2.6	39.5	60.7	4.4	34.9
Sundry	17.7	3.8	88.3	11.7	—
				(Average)	
Total	100.0	100.0	68.7	10.4	20.9

For a few years after the world panic of 1919, the financial condition of the manufacturing industry in Japan was very bad, due to the effects of the panic and the lifting of the gold embargo by the Hamaguchi Cabinet. The situation went from bad to worse. The average percentage of profit of all the manufacturing industries for the first half-year of 1919 was 11.3 per cent, but this was reduced to 8.4 per cent in the second half-year of 1919 and to 4.4 per cent, the worst record, in the second half-year of 1930, as shown in Table XIII. The cotton spinning industry, which was most sensitive to changes in the value of Japanese money in the foreign exchanges was the first to fall in financial results. Almost all the manufacturing concerns suffered losses, and their reserve funds diminished rapidly, although they decisively reduced dividends. In the meantime, gold was put under an embargo in Japan in conjunction with the suspension of the gold standard in England. By the ban on gold, both exchange and financial inflation were brought about. By the Inflation policy of the government, the Japanese manufacturers were greatly benefited, and their financial position became better year after year. Besides the inflation, there was another factor that brought prosperity to the manufacturers. This was a change in government industrial policy. The government authorities relinquished their policy of keeping down commodity prices for the benefit of consumers, the policy that had prevailed since 1916, and began to allow manufacturers to rise prices by the enforcement of the cartel law.

With the improvement in the financial position of industrial concerns, dividends were restored and gradually increased. The average dividend of 4.4 per cent for the second half-year of 1931 was increased to 7.6 per cent in the second half-year of 1933. As the manufacturers have learnt bitter lessons through loose management, they have become very careful in financial matters. They have endeavored to pile up reserve funds to meet depressions in future. Table XIII shows that the reserve funds were greater than the dividends.

Table XIII.—Profits and Reserve Funds of Manufacturing Industries

Percentage of profit

	1924	*1930*	*1931* (*2nd half-year*)	*1932*	*1933*
Spinning and weaving	25.2%	—	7.7%	12.3%	15.2%
Chemical	16.0	6.5	5.1	10.5	17.9
Mechanical	13.4	6.1	2.9	6.5	14.7
Food	27.3	7.2	6.4	11.1	12.8
Sundry	17.0	5.1	0.1 (loss)	6.2	10.4
Smelting	(5.5)	1.6	1.3	2.9	10.8
Average	20.7	4.4	5.4	10.0	15.1
Gas	8.8	9.6	8.7	8.9	8.8
Electric.	10.7	6.5	5.5	4.0	2.6
Electric cars	12.9	—	—	—	—
Total average ..	11.3	6.2	5.0	5.4	6.0

Percentage of reserve funds

	1924	*1930*	*1931* (*2nd half-year*)	*1932*	*1933*
Spinning and weaving	56.8%	*61.4%	*8.1%	48.0%	63.2%
Chemical	37.2	41.0	*4.9	55.3	62.4
Mechanical	43.2	0.8	14.1	23.9	61.6
Food	59.3	59.4	56.4	66.4	71.3
Sundry	*6.4	44.4	*47.1	*35.6	44.5
Smelting	(*53.6)	65.2	73.1	63.1	67.2
Average	50.4	14.1	24.7	54.0	64.3
Gas	15.3	33.1	36.7	37.4	37.6
Electric.	25.9	43.6	51.1	58.7	74.9
Electric cars	30.7	—	—	—	—
Total average ..	42.6	28.5	37.7	54.0	64.9

Note :—The above figures are from reports by the Hypothec Bank of Japan. The figures put in parentheses are not included in the "average" but are included in the "total average." The "percentage of profit" means the percentage of profit against the total amount of paid-up capital, reserve funds, and sums brought forward. "The reserve funds" consist of reserve funds, sinking funds and sums carried forward. The figures marked *show the decrease of reserve funds by the paying back of various funds or carrying forward of funds, and the percentage means percentage of the decreased reserve funds for dividends.

China's Mines

The Ministry of Industry has lately drawn up plans for the group exploitation of various mines in the country with a view to raising China's deposits of petroleum, tungsten, antimony, copper, tin, lead, aluminium, etc.

It is planned that those mines which do not yield satisfactory results, either on account of unrestricted methods of exploitation by private owners, or manipulation by foreign interests, will be designated as State Reserved Areas, to be exclusively exploited by the Central Authorities. Such mines include the lead mines in Shantung, tungsten mines in Kiangsi, manganese mines in Hunan and Kwangtung, potassium chloride mines in Honan and the phosphorous mines in Kiangsu.

With regard to the rich petroleum deposits in Szechuen, the Ministry has completed surveys of the oil-beds in Fushun, south-western Szechuen, which are now being tapped.

As to those mines operated in a small-scale by the local peasantry such as the copper and tin mines in Yunnan, tin mines in Kwangsi, iron mines in Shansi and Szechuen, alum mines in Chekiang and Anhwei and gypsum mines in Hupeh, stricter supervision will be exercised over them. Close attention will be paid, meanwhile, to the methods employed by such small-scale private interests which are mostly rudimentary and unscientific, with a view to improving their methods.

Up to the end of last year, a total number of 28 mines has been designated by the Ministry as State enterprises. A few more, including the petroleum mines in Szechuen, the collieries in Kiangsi and the copper mines in Yunnan will be similarly placed under State ownership, to be exploited by Central Government or leased by it to private interests.

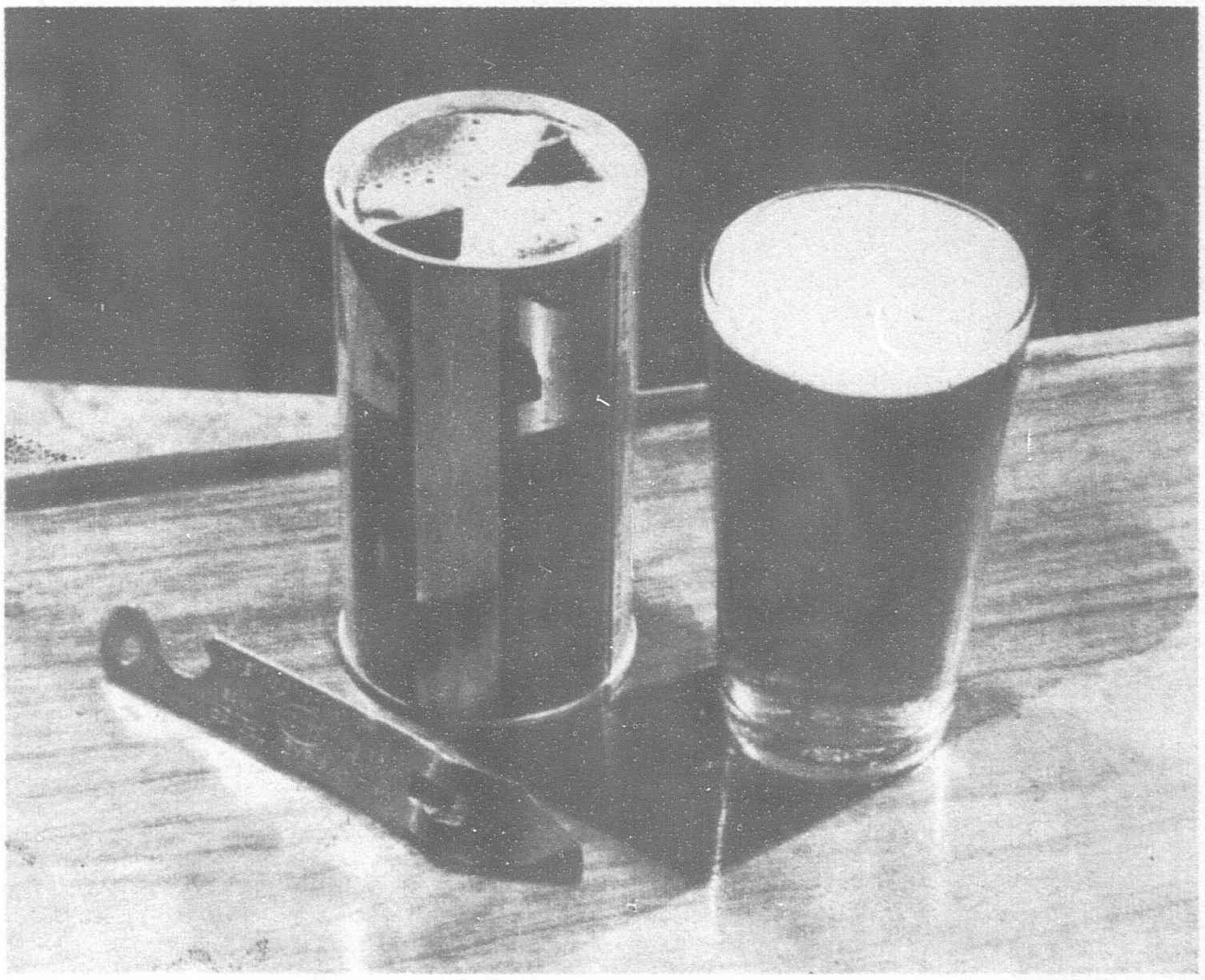
CANNED BEER

(The International Tin Research and Development Council, under whose auspices this article has been produced, is composed of delegates appointed by the Governments of the principal tin-producing countries. It has been established for the purpose of acquiring and disseminating scientific and technical knowledge relating to tin, its alloys and chemical compounds, the processes involved in the production of these materials, and their applications. The objects of the researches and other activities of the Council are to discover and develop new industrial applications of tin, to improve existing products and processes, and to assist tin consumers in overcoming technical difficulties and problems relating to tin).

ALTHOUGH beer in its many varieties has been consumed for hundreds of years, until about fifty years ago the cask was the container almost invariably used for its distribution. Previously a small proportion of beer of special kinds was occasionally contained in bottles but there was no really practical method of distribution, apart from the cask. With the enhanced scientific control of the process of brewing, increasing attention was given to securing improved distribution. The method of treatment by heat was first developed by Appert, whose work led to the establishment of the canning industry. In 1827 he successfully applied his method to wine "must." The first mention of heating beer for bottling was in a patent of two Englishmen in 1845 who described how beer, held at a temperature of 150° F. for a short period, would keep indefinitely in bottle. The importance of this discovery in relation to bottling was not, however, appreciated until twenty years later, when Pasteur investigated the causes of deterioration of wine scientifically and laid down rules for applying the process to beer intended to be bottled. Some years after this there was developed in the United States a method of bottling, which consisted in chilling, carbonating and filtering the beer. This method, in conjunction with the pasteurizing treatment, provided at the beginning of the 20th century all the necessary conditions for the successful establishment of the bottling industry. In the next ten years or so enormous progress was made. Thus by 1921 the annual production of bottled beer in the United States was 3,000 million.

The factors underlying the adoption of the bottle as a container for beer were in large part due to the following causes. (1) The improving transport facilities which encouraged people to live farther from their work and to go farther afield for their pleasures; shorter working hours and greater leisure, which encouraged a greater variety of recreations and amusements, so that public houses and saloons became less and less social centers. There was a demand for beer to be available when and where people happened to be. (2) Brewers had to meet the changes caused by the greater mobility of their customers by making their particular brands available as widely as possible. In turn this led to the different brands becoming more generally known and a greater range of choice to the consumer than when beer in the cask was the only source, and, consequently, only two or three kinds of beer could be kept in any one establishment.

In this development the only important changes in respect to the bottle have been in the closure. The bottling system involved collection of the bottles after use and the expense of new corks. The moulded screw-stopper, which was tried as an alternative to the cork, had the advantage of being re-usable but called for special care in sterilizing. This difficulty was overcome by the adoption of the crown cork made of tinplate, which was cheap to make, and could be thrown away after use.



A Can of Beer and the Can Opener

In 1935 came the first serious attempt to make the whole container of tinplate. Like bottling and the initial adoption of the crown cork, this development originated in the United States.

On January 24, 1935, Krueger beer was on sale in Richmond, Virginia. The immediate success here led to its being soon made available in North Carolina and West Virginia. In the early summer other brewing companies were entering the market and at the present time it is known that about two dozen American firms are engaged in canning part of their output, while reports mention many others as actively preparing to do so.

The Consumer and Canned Beer

The can offers many advantages to the consumer. It is much more compact than a bottle of the same capacity and is not fragile. Since the can for beer can be used only once, no monetary deposit is required; after use it is thrown away. A can of beer weighs barely one half as much as a bottle of beer of the same capacity. The same quantity of beer is thus much easier to carry home from the shop. Where larder space is restricted, the saving with the can is a consideration, and in hot countries where a refrigerator is usual equipment in the home, the saving of space becomes even more important, added to which the metal can cools more quickly than the glass bottle. The saving of space and weight in picnic hampers also appeals widely.

When beer canning was in the experimental stage the brewers concerned made a survey of the opinions of 1,000 regular customers on the new product. Of the 756 who replied, 89 per cent liked the beer in cans and 92 per cent declared the cans to be a real advantage. The saving of space in the refrigerator appealed to 85 per cent, 92 per cent liked the idea of a non-returnable container, while 53 per cent said they preferred canned beer if it cost no more than bottled, and another 35 per cent were prepared to pay more for canned than bottled beer.

The Retailer and Canned Beer

Delivery of canned beer to the consumer is speeded up and cheapened because of the saving in weight and space. As may be seen from the accompanying table the space occupied by open crates containing bottles is more than three times that for the same quantity of beer in cans, and the weight of the former is more than double that of the latter.

The saving of space enables the existing store-room to hold correspondingly more beer—an important consideration where space is restricted or where rents are high, or where there are large occasional sales, as in bars run in connection with sports grounds and other places of entertainment.

The risk of breakage due to rough handling while in stock and during delivery is practically eliminated. Cans are attractively lithographed and lend themselves to effective window and shelf display.

No deposit is charged on cans, so that book-keeping is simplified and retailers are not concerned with returned empties.

The Brewer and Canned Beer

From the point of view of the brewer the following comparison between cans and bottles sufficient to contain a standard (English) barrel of 36 gallons is of interest.

Comparison of volume and weight of 36 gallons of beer packed in :—

(1) 12 oz. cans in cartons.
(2) Half-pint bottles in wooden crates.
(3) 12 oz. bottles in sealed cases.

	Cartons of 12 oz. cans.	*Open Crates of half-pint bottles.*	*Ratio of crate to carton.*	*Sealed cases of 12 oz. bottles.*	*Ratio of case to carton.*
Unit Package :					
Length	16½-in.	21-in.	—	26-in.	—
Breadth	11-in.	14-in.	—	14-in.	—
Height	5¼-in.	10-in.	—	13-in.	—
Contents ..	2 doz. 12 oz. cans	2 doz. half pint bottles	—	6 doz. 12 oz. bottles	—
No. of Unit Packages to contain 36 gallons	20	24	—	6⅔	—
Total Volume ..	11 cu. ft.	41 cu. ft.	more than 3 times as great	18¼ cu. ft.	1.6 times as great
Gross Weight ..	505 lb.	1,255 lb.	2.5 times as great	980 lb.	1.9 times as great

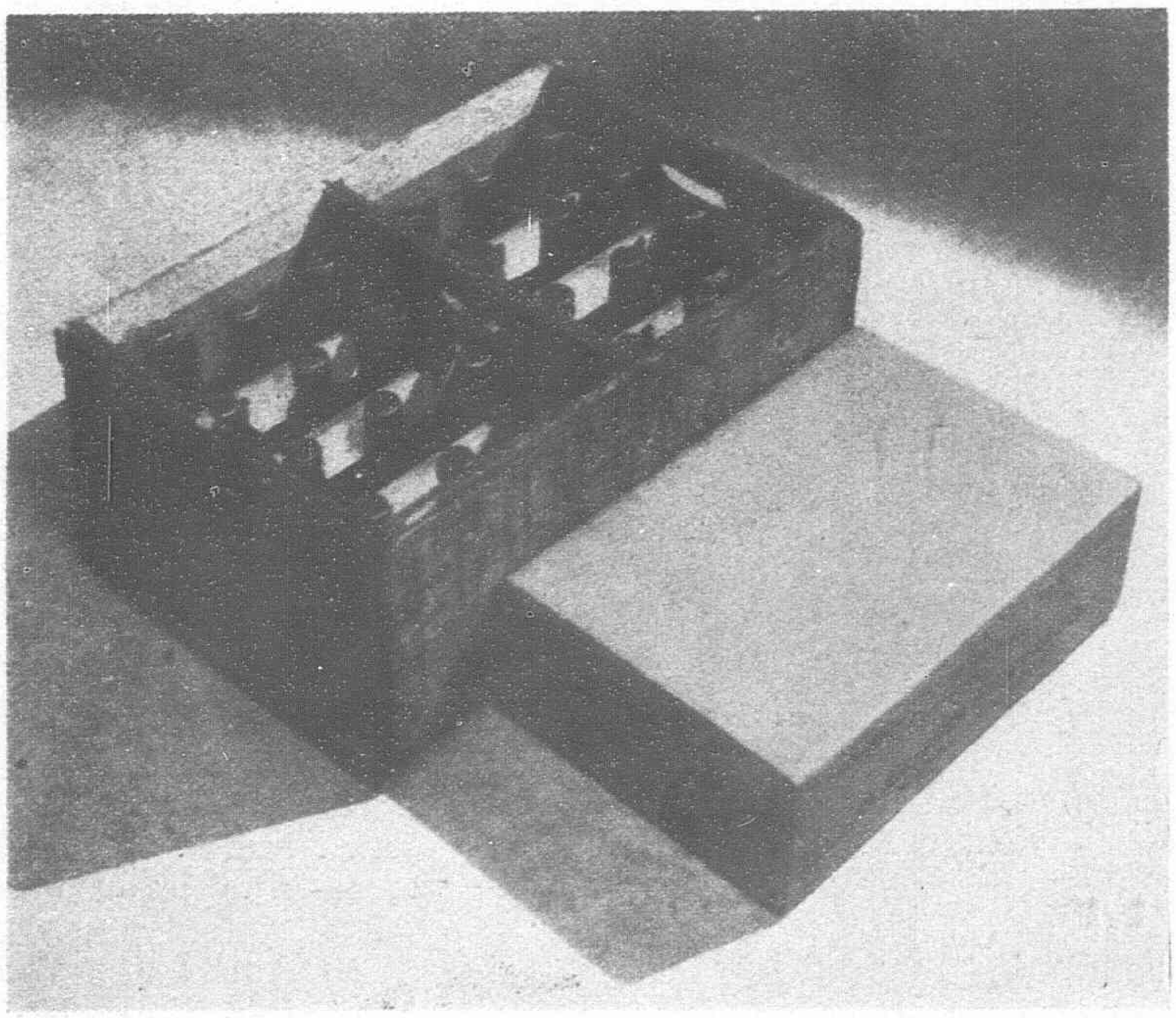


Fig. 1.—The contrast—The 24 bottles in the crate, and five more bottles besides, contain only as much beer as the carton of cans

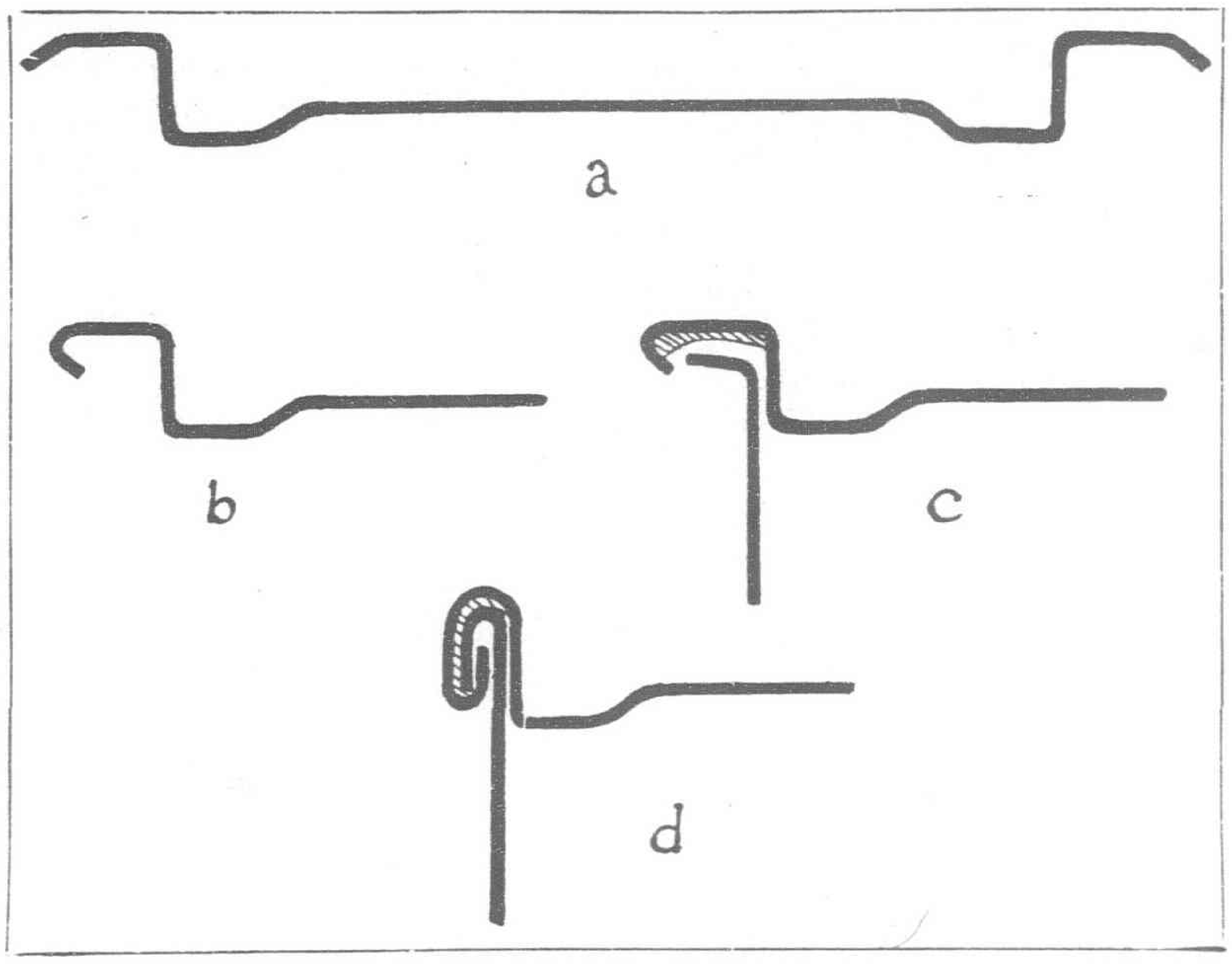


Fig. 3.—The forming of the double seam

It is evident that the saving in space shown is of great advantage to the brewer in being able to store many more empty and full containers, and in increased handling facilities on his premises. The necessary equipment for canning occupies only half the floor space required for bottling plant, and no space is required for machinery for soaking and washing bottles returned from customers The compact unit for washing new cans may be suspended from the floor above and actually occupy no working floor space.

The pasteurizing and cooling of cans is quicker than that of bottles, enabling the output to be increased.

The effect of light on beer is harmful to it, but the use of tinplate containers, which are totally impervious to light, prevents this action.

The reduction in space occupied by filled cans as compared with bottles results in a saving in transport costs.

Cans are not returnable and book-keeping is simplified as it is with the retailer. One big advantage to brewers in the use of cans is that beer is securely sealed until it reaches the consumer and there is no risk of the contents being tampered with, a matter of particular importance to the reputation of established brands.

Special Features of the Can for Beer

Tinplates are usually made in standard sized sheets 28 by 20 inches. Lithographing is carried out usually by the can-makers themselves by an offset process on the full-sized sheets, each sheet being covered on one side with reproductions of the can design. By the use of transparent colored lacquers very brilliant and striking effects can be obtained on the bright tinplate surface.

Can-Making

The lithographed sheets of tinplate are fed through slitting machines which cut them into strips the size of can bodies, which then pass through body forming machines which bend them into cylinders, lock the edges in a locked side seam, and solder the joint from end to end (Fig. 2). The ends of these can bodies are then slightly flanged out ready to receive the can ends, which have been stamped out on other machines and coated with an inert sealing composition on their edges. The can body and a can end are

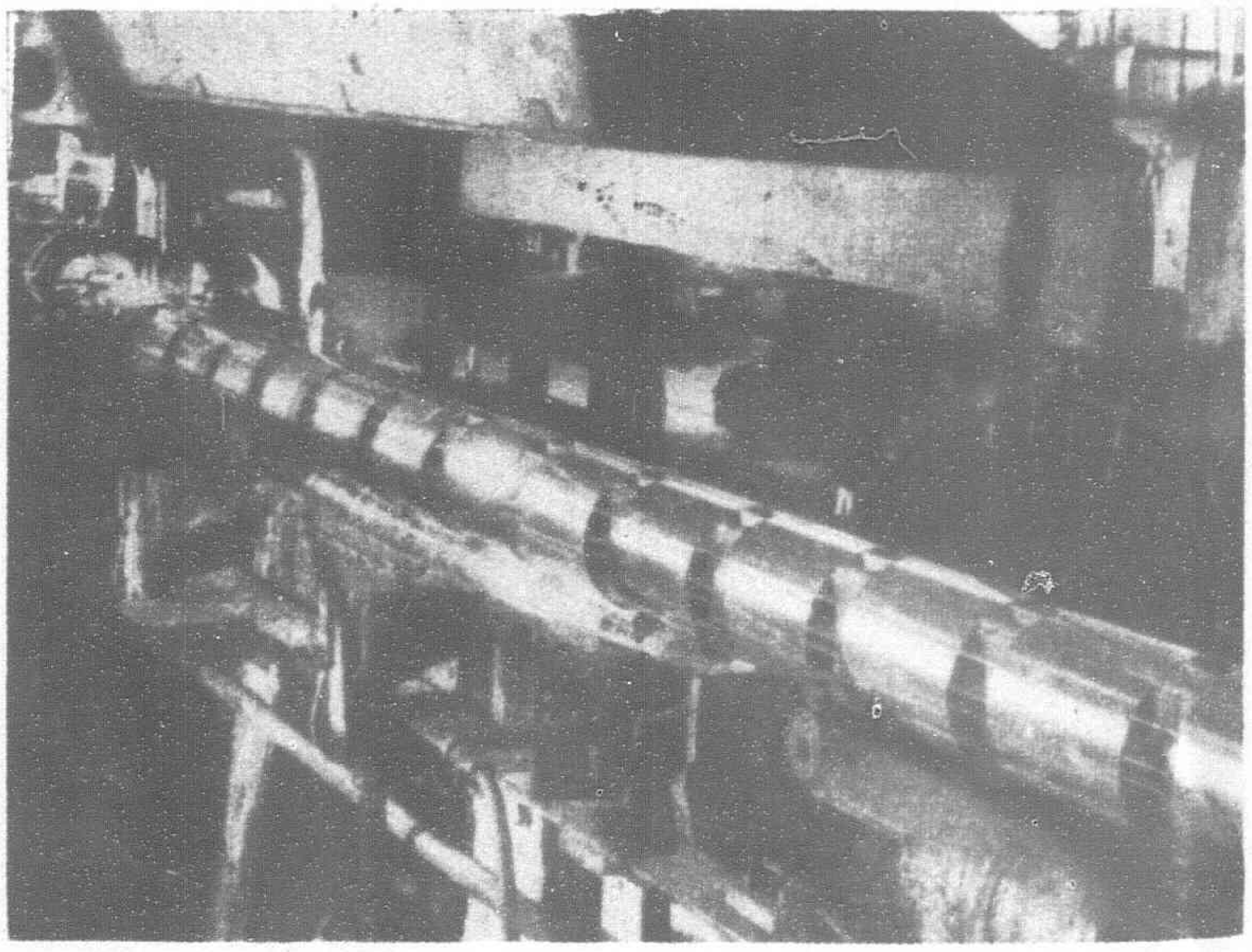


Fig. 2.—Three hundred cans a minute

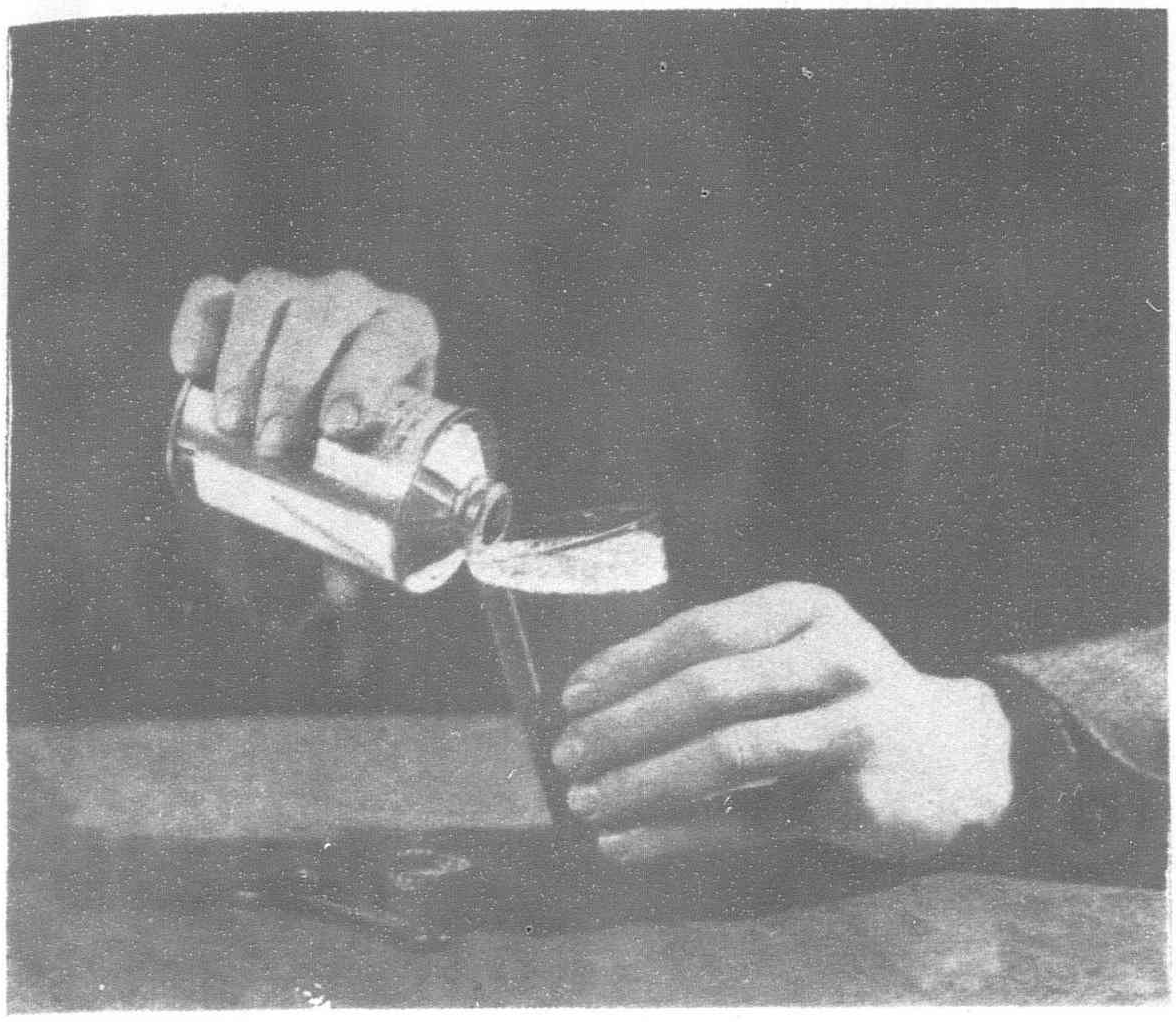


Fig. 4.—A Can with a Crown Cork

placed in position and folded together on a double seaming machine. Fig. 3 *d* shows a section through the joint so formed. The operation of attaching the top to the filled can is exactly similar.

By the use of " lines " of multiple machines, working at high speed, cans are produced at the rate of 300 a minute on each line.

Cans made by the processes described above are used as containers for a wide variety of foodstuffs, but some important modifications are necessary both in the materials of the can and in the processes of manufacture when the contents are to be beer.

The chief points of difference from the canning point of view between foodstuffs and beer are the alcohol content and the relatively high pressure of gas in beer. The lacquers used for lining cans intended for foodstuffs are not suitable for beer and the extra pressure in the can makes it necessary to provide a much stronger can.

Strengthening the Can

A gauge of tinplate heavier than that used for cans for ordinary foodstuffs is used, and the soldered side seam is reinforced by allowing the solder to penetrate more completely between the folds of the lock seam. This involves the prefluxing of the hooks on the body blank by a stronger flux than usual, which is then dried off. Further to assist this penetration of solder, one type of beer can has three notches about $\frac{1}{4}$-in. long in the outer hooking edge of the body blank so that at these points the side seam is of a simple lap type. A very fluid solder is also an advantage, and for this, one having the eutectic composition of lead 37 per cent, tin 63 per cent, melting at 183°C., is suitable, since it is fully fluid up to the moment of setting.

The sealing composition, which is used to make a hermetic joint between the can ends of the body when these are curled together, must be insoluble in water and in alcohol and contain nothing which would in any way affect the beer if it should come in contact with it through the double seams temporarily opening out owing to internal pressure in the can during pasteurization. In addition the sealing compound must withstand the temperature at which the can ends are baked. These requirements were only imperfectly met by existing sealing compositions, and makers of these compositions have had to undertake a considerable amount of research before the present satisfactory compounds were discovered.

Lacquers

A considerable amount of research has been necessary to provide lacquer that does not impart any flavor to the beer during prolonged contact. In general, the tinplate is given an initial coating of a suitable lacquer before being cut up into can bodies or stamped out into can ends. After being formed, the body blanks for the beer cans are spray-lacquered inside so that the entire surface, including the soldered seam, is coated with a superimposed layer of the special lacquer. The bodies are then baked at a suitable temperature for a sufficient time to complete a chemical change which makes the special lacquer entirely inert in contact with beer. The can ends are also spray-lacquered after the groove has been filled with the sealing compound, care being taken to prevent lacquer depositing over the sealing compound.

In some types of can the coating is a waxy composition unaffected by contact with beer.

Shape of the Cans

The original beer can had a flat top and was 4$\frac{13}{16}$-in. high and 2$\frac{11}{16}$-in. in diameter, or in the American notation 413 by 211. This can holds twelve fluid ounces. Some months later a can with a conical top and a short neck, which could be closed by the crown cork identical with that used for bottles, was brought out. The flat-topped type of can is easily and quickly opened by the use of the special openers which are provided with each case of cans, as illustrated and the crown cork-topped can is opened by the usual bottle opener (Fig. 4).

Canning Beer in a Brewery

The following is a brief account of the processes involved in canning beer in a brewery. The actual details may vary slightly from one brewery to another, and there are many different makes of machinery available.

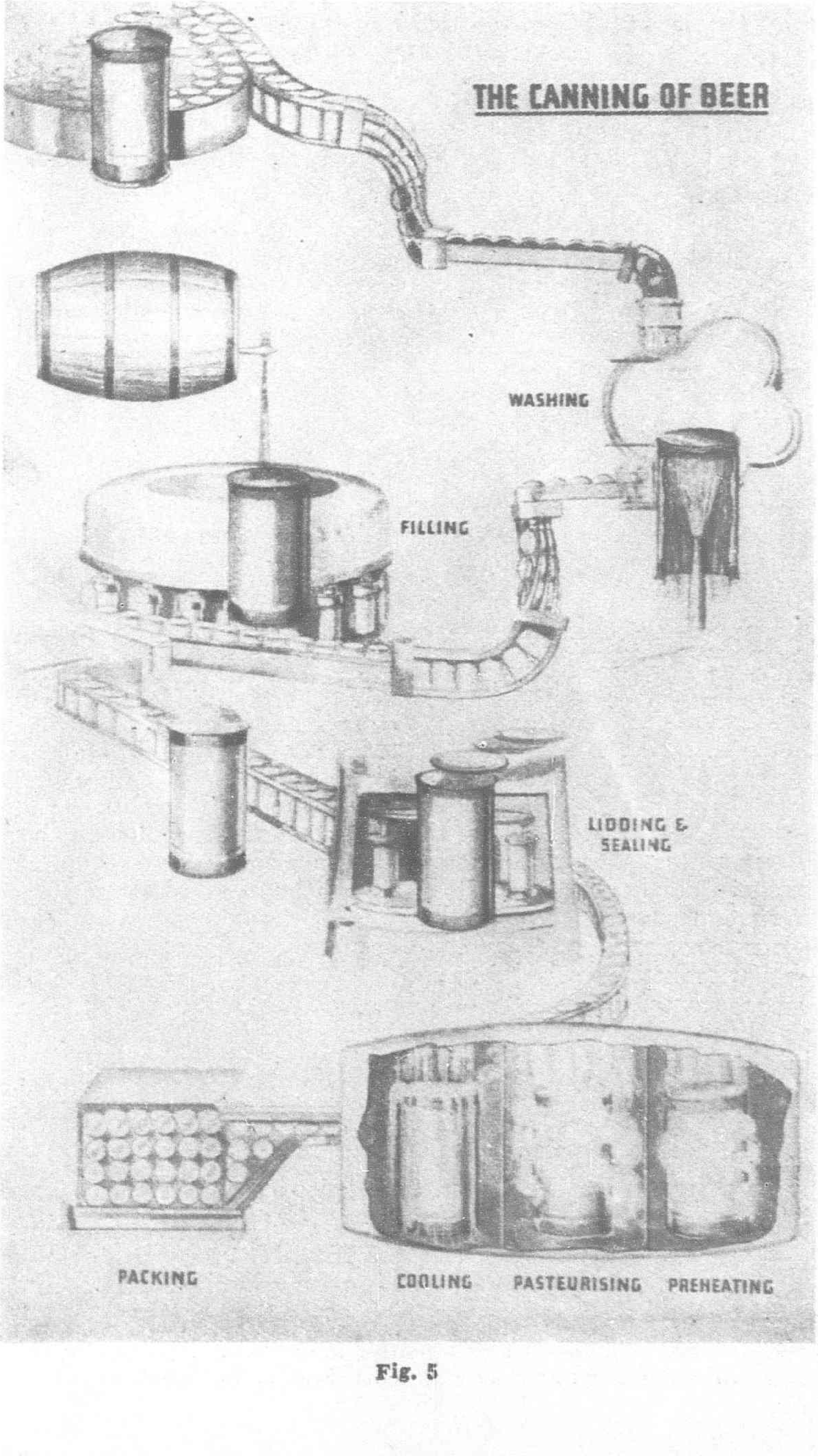


Fig. 5

The empty cans, having a closed end and open top, are first washed by jets of hot or cold water, or steam, as desired in a machine which operates under a variable speed control so that the cans may be supplied to the filling machine in a clean condition at the required rate.

The filling machine is of the same type as that used for filling bottles, but is provided with a modified filler head. The loss of gas from the beer during filling is very small. An interesting feature is the use of an electrode contact device on the way to the can-closing machine. If a can is insufficiently filled, the electrode fails to make contact with the beer and does not complete the electrical circuit which permits the can to pass on to the closing machine.

Immediately before applying the lid, a jet of beer is shot into the can to cause a slight foam which displaces atmospheric oxygen in the head space. The lid is then applied and sealed by automatic machinery.

The closed cans then pass to a spray-type hot-water pasteurizer in which they pass through three stages—preheating, pasteurizing and cooling. The whole process lasts about 45 minutes, during which the cans are kept at 142°F. for twenty minutes ; on leaving the pasteurizer they are about 5°F. warmer than room temperature. They are then dried by means of an air blast.

Finally the cans are passed to a machine which marks the ends with ink according to a code decided on by the brewer. The marking dies can easily be changed as desired. The coded cans are loaded into cartons, ready for storage or transport.

Present Possibilities

Although it is less than a year since canned beer was first made available to the public, a reliable estimate places the output at the present time as at least ten per cent of the total of packaged beer in the U.S.A., the balance being bottled. An official forecast by the United States Revenue of the output of beer in 1936 is between 48 and 50 millions of barrels of which 70 per cent will be in casks and 30 per cent packaged. This quantity of packaged beer would require about 5,000 million 12-ounce containers, either bottles or cans. American sources estimate that 30 per cent of this quantity, that is to say, 1,500 million, will be cans. Three million base boxes of tinplate would be required for this production, representing about 150,000 tons of steel and 2,000 tons of tin consumed.

There seems to be no reason why this development should in the future be confined to the U.S.A., as the inducement to the consumer, the retailer and the brewer would appear to be strong in other countries. Already in Great Britain at the end of 1935 the experiments in canning beer had begun, and there is evidence that consideration is being given to the possibilities in other European countries which export large quantities of lager.

Wine, spirits, cider and mineral waters are other beverages for which cans may prove to have definite advantages.

Japan's Finances

(Continued from page 156)

banks. But I do not believe that adequate consideration has been given to or necessary preparations made to enable the nation's financial organs capable of staving off difficulties in time of war as in time of peace. These organs often confront difficulties even in peace time, and are destined to encounter still greater hardships should the nation ever be involved in hostilities. In view of this contingency, it is a matter of paramount importance to establish a steadfast policy in order that these can remain un-disturbed even in time of war.

* * *

Policies Win Support

Supplementing the foregoing the following news dispatch issued by *Domei*, on April 2, is of interest :

Dr. Eiichi Baba, Minister of Finance, to-day had obtained the support of Japanese industrial and financial leaders in his projected reforms in the nation's economic structure.

In a three-hour meeting with business men from the Tokyo, and Yokohama area, headed by Baron Seinosuke Goh, President of the powerful Economic Federation, Dr. Baba last night explained his policies for a gradual solution of the various issues confronting the nation.

His views were subsequently endorsed by Baron Goh, who acting as spokesman for the assembled industrialists and financiers, declared in a statement to the press that they all shared the belief that the country's economic ills " would soon reach their moderate and appropriate solution gradually through the co-operation of officials and citizens as a whole."

" We are convinced that Japan's national destiny is based upon the prosperity and the development of industry and trade," the statement continued. " These are also indispensable conditions for the stabilization of national life.

" Consequently, not only should we devote our energies in this direction, but we should seriously study matters which should be improved so as to keep up with the trend of the times. Reforms which must be carried out, should be adopted without delay.

" And if these new policies can be quietly carried out by both officials and citizens without causing serious upheavals in our economic structure, we believe that the latter will soon enter upon a new age, consonant, with the national state of affairs, to contribute to the enhancement of our national desinty," the statement said.

Dr. Baba spoke for one hour, giving in detail what he considered the limit Japan could spend on strengthening her national defenses, " Manchoukuo " and the Hirota Government's principles in issuing bonds.

In a subsequent free discussion, Dr. Baba was vigorously questioned on his program by Baron Goh, Mr. Takashi Izaka, president of the Yokohama Chamber of Commerce and Industry ; Mr. Tsuneta Yano, president of the First Mutual Insurance Co., and Mr. Manzo Kushida, managing director of the Mitsubishi Goshi Kaisha.

The Coal Industry in China

(Continued from page 174)

population of 400,000,000 people, gives a *per capita* consumption of about 0.05 ton, much too little to maintain the standard of an industrial nation. The yearly production and consumption of coal in China should be double the amount now produced, and in order to achieve that end, we have to take the following steps :

(1) Give more financial assistance to operators.
(2) Exploit new mines entirely by modern process.
(3) Improve mining methods in existing collieries.
(4) Select appropriate and cheap motive power and try to electrify the industry as much as possible.
(5) Manage technical labor and business affairs on a scientific basis.
(6) Give more attention to coke-making and by-product extraction.
(7) Improve transportation facilities.
(8) Establish an experimental station for fuel.
(9) Encourage the export of coal.
(10) Enforce a protective tariff on imported coal.

Government Scheme of Financing Mines

During recent years most of the collieries in China have suffered seriously from business depression as well as the competition of foreign coal, and have applied to the Ministry of Industry for financial help. The Ministry at first contemplated an issue of coal bonds to the amount of $20,000,000, the proceeds to be distributed among the different collieries, to be used in development projects enabling them to cut down cost of production, but owing to the fact that security for such a bond issue could not be provided by the Ministry of Finance, this project was not carried out.

The Ministry of Industry has now devised a scheme to finance the collieries by a special arrangement with the banks. Upon recommendation of the Ministry, mine operators and bankers may directly negotiate a loan, the Ministry giving a guarantee for the money advanced, but the terms of the loan must be approved by the Ministry, which acts as go-between and stands in the position of guarantor.

The Buryat Mongol Autonomous Republic

By *G. D. R. PHILLIPS*

BURYAT Mongolia, just east of Lake Baikal in the center of Northern Asia, is one of those regions known as "Autonomous Socialist. Soviet Republics;" there are several of them in the Soviet Union, but a period spent last summer in the capital of Buryatia, Verkhne Udinsk on the River Selenga, gave me an idea of how these autonomous republics work in practice: for many sneers are cast at them outside the Soviet Union, many allegations that they are autonomous in name only, and are really exploited colonies of Moscow.

The "autonomous republics" are not the primary constituent parts of the Soviet Union. Buryatia, for instance, is a part of the East Siberian Territory, which is part of the Russian Socialist Federative Soviet Republic, which in turn is one of the seven republics making up the Soviet Union.

Thus the Soviet administrative system appears much more complicated than, say, the federal system of the United States of America; yet in fact it works much more simply. It is not true to say that the autonomous republics are colonies. They are not exploited for the benefit of Russia or of Moscow. They are, it is true, exploited for the benefit of the whole Soviet Union, but since that applies equally all round, there is no unfairness. And besides this distributed exploitation, the inhabitants of the particular regions are urged to exploit their resources for themselves as well.

A Sports Parade at Verkhne Udinsk

To continue the comparison with America, it is true to say that these autonomous republics have a certain measure of real autonymity, like the United States; in different areas it may be more or it may be less. But there are two very important differences between the American and the Soviet systems. First, the Soviet Republics are grouped according to the location of national minorities: thus there are the republics of the Buryats, the Oirots, the Yakuts, the Kirghizes, the Tadjiks and many others; thus, too, some of these republics are actually in two separate parts, where a section of the people of one particular nationality has been separated from the rest: this is the case with Buryatia—there is a small separate area to the east, on the River Onon. Secondly, the republics have the free right of secession from the Soviet Union if at any time they should desire it.

Matters concerning the Union as a whole are, of course, reserved to Moscow.

Heavy industries are under the control of Moscow: as, for instance, the huge new railway repair depot at Verkhne Udinsk, which will serve much more than merely that part of the Trans-Siberian Railway which passes through the country. But light industries are planned, built and run by the Buryat Soviet, by the Buryats themselves, for their own benefit. They build their own hospitals and train their own doctors, train their own teachers, engineers, scientists, specialists. They build and run their own theaters and cinemas. In everything that concerns the Buryats alone, the Buryats are the rulers.

Do the peoples of these autonomous republics really believe in their autonymity? Do they feel themselves to be free from unfair exploitation? Are they allowed to govern themselves to any real degree? I saw something of the answers in Buryatia.

Buryatia is not a show place of the Soviet Union, not an autonomous republic specially well treated for the benefit of foreigners. It takes a long time — one week from Moscow by train — to get to it at all, and so few foreigners ever go there that Intourist, the official tourist agency for foreigners in the U.S.S.R., has no representation in Verkhne Udinsk or anywhere else in the republic. Eastwards from Nijni-Novgorod (Gorki) there is no Intourist hotel, with lifts and white-coated waiters and jazz band, until one gets to Vladivostok; in Verkhne Udinsk there is only an ordinary hotel for Soviet citizens who have business in the Buryat capital. No-one told me that I ought to see Buryatia. I simply went there out of a long-felt desire to see Mongolia, and the question of autonymity only began to interest me after I got there and saw what was happening in this Mongolian country.

Buryatia formed itself into a Soviet Republic only so recently as 1923, after its inhabitants had taken part in the expulsion of the interventionists. One of these bands of "White Guards" was forced over the frontier into Outer Mongolia; it drifted along the north-west edge of the Gobi Desert and eventually arrived in Chinese Turkestan, where it formed itself into a thorough military detachment which is very active in that region.

Soon after forming itself into a Soviet, Buryatia joined the Soviet Union, and this marked the beginning of the recognition of Buryatia as a nation.

They were a nation once before—a nation of barbarians, almost savages, but free, and proud in their memory of Jenghiz Khan. Then the Cossack atamans in their eastward sweep overran them and crushed them underfoot, and were only followed by the tsarist chinovniki or officials and Russian traders. The Buryats' own huge Lama priesthood had already weakened them, and they quickly fell prey to the alcoholism and disease that the intruders brought.

Naturally, their country soon became no place for a holiday, and one way of punishing offending officers in St. Petersburg was to put them in charge of districts in this and similar regions. The Decembrists, people involved in the unsuccessful revolution of

1825, were exiled to Buryatia, and that was considered a dreadful punishment.

So much for past history. Now consider the general idea of Mongolia, of a Mongolian town, as it is usually described in books of exploration: dirty reeking, insanitary dwellings of wood or mud; no streets worth calling by the name; no public buildings; practically no law or order; filthy, verminous, lazy, scabby people; and a general atmosphere of laissez-faire.

See now Verkhne Udinsk, capital of the Buryat Mongol Soviet. It is sandy, but clean. Its streets—wide, sunny, airy—have wooden pavements on each side; pavements which are easy and cheap to build and repair, and pleasant to walk on. I watched the pavement of a long street re-laid in a day. On the hill is the "new town" of fine wooden apartment blocks replacing the older insanitary dwellings by the river. New buildings of stone and brick and concrete are everywhere, and more are rising. Lorries, cars and bicycles ply the streets. Aeroplanes fly above. The people are well dressed, with plenty of work—at seven hours a day—and plenty of good food.

In the country around is left only an occasional "yurta"—the old felt-covered, dirty tent of the nomads. In their stead are the strong new buildings of the collective farms.

The young men and women all work. They have lost their traditional fatalism, they have forsaken the Lama datsans or temples and laugh at the priests; but they have not lost their nationality nor their sense of nationality because of this. Indeed, instead of the old life they now have a practical job on hand with a practical aim: the betterment of their own lives and their own country of Buryatia. They make glass; they build the railway repair shop—which will help them as well as the rest of the Union; they can meat; they fly aeroplanes; they drive lorries or ride their own motor-cycles and push-cycles; they make electricity for their homes and clubs; they build, and build, and build.

A Buriatian member of the Red Army

The Buryats are to be seen in positions from the highest to the lowest. They hold responsible positions in banks, theaters and offices of all kinds. They are engineering experts, teachers, skilled men and women in every activity, highly paid. They print and edit their own papers, write their own books. And in all the different kinds of work they are taking over more and more control from the Russian instructors who remain.

Twelve years ago, no more, they were primitive nomads, on a level practically with the North American Eskimo. Last summer I met a young Buryat who was a member of the Republic Soviet. He was helping to govern his own country. And it must be remembered that not only members of the Communist Party, Mongols or Russians, are elected to the Soviet; often non-members are elected in their stead—and the Party considers that good, as showing public interest in public administration. Even a foreigner who is not a Soviet citizen at all, such as an American technician, can be elected.

Are the Buryats unfairly exploited as a colony? The Buryat factory workers are armed with rifles, and trained in the use of them, as auxiliary forces to be used in the event of war—such confidence has the government in the loyalty of the people to the system under which they now live. There is keen competition at the shooting range, and much long practice to attain the standard of the "Voroshilov shot." Voroshilov, Commander of the Red Army, is a very fine marksman, and those who can shoot as well as he are given a special medal. The regular Red Army soldiers are counted in Buryatia as friends, not as oppressors; they could not be oppressors, for they are drawn from the homesteads of the Buryat towns and villages.

The Buryat Soviet State Building on the hill at Verkhne Udinsk is built of concrete, on a rock foundation in the surrounding sand. It is a great house, and it signifies the growing greatness of the nation of which it is the center.

Chinese Wolfram Trade

Total exports of tungsten ore from Shanghai during the last quarter of 1934 amounted to 837,750 lbs., of which the United States received 55,997 lbs., Germany 335,982, Great Britain 183,864, France 161,157, and Belgium 44,753 lbs. Exports during 1934 totalled 746,666 lbs., of which the United States accounted for 201,600 lbs., Germany 309,866, Hongkong 112,000 and Great Britain 67,200 lbs. Shanghai had no uncontracted-for stocks of tungsten ore on hand at the end of December last. Besides the continuance of Changsha as an important outlet for tungsten-ore exports, a new development has arisen to threaten the Kwangtung provincial tungsten monopoly. The Chinese National Government succeeded in subduing the communist area in Kiangsi province in the last quarter of the year, and transportation and communication with the Yangtze River is being restored. With this development, which will enable Kiukiang to play the rôle of a tungsten-ore export point again, it may be expected that the Kwangtung monopoly will receive a smaller amount of ore from the Kiangsi mines. The Kiangsi Provincial Government is reported by the Press to be organizing a wolfram mining bureau. Reliable figures regarding production of tungsten ore in Kiangsi are impossible to obtain in Hankow, owing to the isolated character of the mining area. It is believed, however, that production amounts to between 500 and 600 long tons a month. The annual production of Kiangsi in 1934, on the basis of quarterly estimates, was 6,000 to 7,000 tons, approximately the same as in 1933, while Hunan production estimates for 1934 totalled 600 long tons, the same as the estimated annual production for 1933.—*Iron and Coal Trade Review.*

The Metropolitan-Vickers Trafford Park Works

ABOVE is given a new and up-to-date aerial photograph of the Metropolitan-Vickers Trafford Park Works. It is believed that this illustration will be welcomed by the many present and past employees of the Company, and also that many users of Metrovick plant throughout the world will be interested to see a view of the Works from which their plant has come.

As some measure of the size of the Works it may be noted that the total ground area is 130 acres ; the frontage occupied by buildings is 1,800-ft. ; the distance through the Works from the North gate (seen near the left-hand side in the picture) to the South gate by the water tower is 2,040-ft. and the height of the familiar water tower is 209-ft.

Referring to the illustration, the first two buildings on the left are the foundries, while the next building contains the forge and the transformer department. Beyond the foundries, to the right, is a long three-storey building, shown with four long skylights, which is the meter and instrument department, and beyond the transformer department is a long building, in two sections, devoted entirely to the production of welded steel parts.

Behind the front six-storey block of main offices are the two 900-ft. long main mechanical and electrical machine aisles and galleries, and beyond these in the vicinity of the water tower is a group of buildings containing the various sections of the research department.

To the right of the main aisles are the warehouse and canteens (in which nearly 4,500 meals are served daily) and to the right of these is a new shop, termed the West Works, erected about seven years ago to relieve congestion in the main shops, and now devoted entirely to the manufacture of high voltage and metalclad switchgear.

It may be recalled that the Company was formed in July, 1899, as the British Westinghouse Electric and Manufacturing Co. and that the change to the present name was made in September, 1919.

The building of the Works commenced early in 1901, when there were eleven million bricks to be laid, 17,000 tons of steel, 9,000,000-ft. of timber and 300,000 sq. ft. of glass to be worked into the building. No less than 3,758 workmen were employed and it is said the rate at which bricks were laid rose from 400 to 1,500 and on common work to 2,250 bricks per man per day.

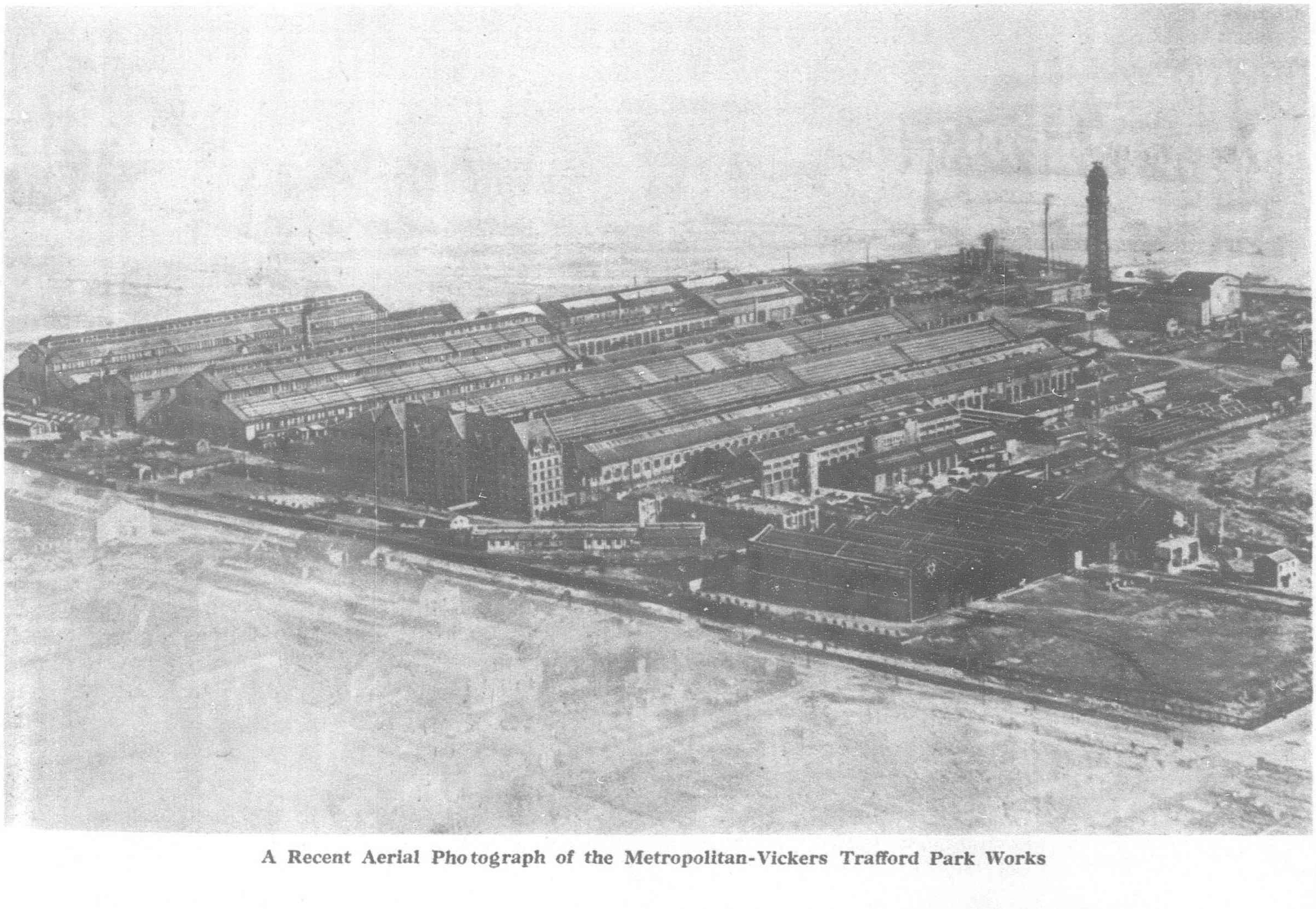
It is sufficient to record that the work was pushed forward with capable organization and great energy, and that about the end of the year delivery of manufactured goods commenced.

To meet increasing demands for the Company's products some of the original buildings such as the foundry have been enlarged and new buildings have been erected, such as the welding shops, warehouse, canteens, west works, research department laboratories, etc.

Passing from the buildings, a brief reference may be made to their equipment. A progressive policy has caused obsolete tools to be scrapped, and has made generous additions of the most up-to-date machine tools and other manufacturing appliances available, with the result that the present equipment of high grade manufacturing facilities is outstanding in its excellence, and undoubtedly a matter for great pride.

To keep this great works busy, orders to the total value of £20,000 a day are required, and many readers may be surprised to learn that the value of the average order is well below £200.

The Company attributes its notable success, in no small degree, to the efforts made continually by research work to improve both the designs and methods of construction of all its products, this work being done not only in the actual research laboratories but throughout every department in the organization.



A Recent Aerial Photograph of the Metropolitan-Vickers Trafford Park Works

Engineering Notes

RAILWAYS

ELECTRIC RAILWAY PLANS.—A report from Tokyo states that the State Railway authorities have in hand plans for the electrification of 280 miles of line between Numazu and Kobe.

NEW RAILWAY STATION.—The new railway station at Hengyang (Hengchow), on the Chuchow-Shiuchow section of the Canton-Hankow Railway, has been opened at an impressive ceremony.

NEW LOCOMOTIVES.—The Peiping-Hankow Railway Administration, in a memorandum to the Ministry of Railways, reports that the Administration is placing an order in Europe for 20 locomotives at a cost of $6,100.000.

NORTH KOREAN RAILWAY.—Negotiations for the purchase of the North Korean Railway, which it at present manages, and the harbor facilities of Chosen's three new ports, Yuki, Rashin and Seishin, which it built, will soon be undertaken by the South Manchuria Railway Co.

WUHU-CHAOHSIEN RAILWAY.—The railway between Chaohsien and Wuhu is being constructed and it looks as if the line will be open very soon. This will connect Wuhu, Chaohsien and Luchowfu, and from there the line proceeds to Pengpu. Four new engines that arrived in October for the Wuhu-Nanking line are in constant use, and on April 1, a through train commenced operation between Wuhu and Nanking. The Wuhu-Nanking train compares very favorably with any train service in China. The cars are clean and no tips are allowed.

RAIL-LAYING COMPLETED.—Rail-laying work on the Nanchang-Yushan section of the Chekiang-Kiangsi Railway having been completed, the section was expected to be opened to traffic last month. Meanwhile construction work on the big iron bridge at Kweichi is proceeding apace.

RAILWAY AMALGAMATION.—Amalgamation of the Taokow-Chinghua and Peiping-Hankow Railways has been decided by the Ministry of Communications. Opened to traffic in 1904, the Taokow-Chinghua Railway runs through northern Honan and connects with the Peiping-Hankow line at Sinhsiang.

HUAINAN RAILWAYS.—Ushering in a new era in railroad development in Anhwei, the Huainan Railway which cuts through the heart of the province has been completed. The line which measures 220 kilometers has already been opened to freight traffic, and passenger traffic will be inaugurated this spring.

DEVELOPMENT OF HAINAN.—Another great South China sea port is in the making, as the Kwangtung authorities have formulated plans to develop Hainan Island, the noted fruit area and the largest isle off the south coast. The Kwangtung government has, in addition to hastening completion of the highway network and the construction of several piers, planned the building a round-the-coast railroad in Hainan. A definite project has now been drawn up by a Dutch railway engineer. According to preliminary information, Kwangtung will approach the Ministry of Railways for a part of the Sino-British Boxer Board railway loan for the construction of the projected line.

EQUIPMENT ORDERED—The Metropolitan-Cammell Carriage and Wagon Co., Ltd., has received from the Chinese Government Purchasing Commission an order for 100 all-steel bogie covered wagons of 40 tons capacity for the Canton-Hankow Railway.

RAILWAY EXTENSION.—The route for the Hunan-Kiangsi section of the projected Nanking-Hunan Railway (an extension of the Chekiang-Kiangsi Railway) has been fixed subject to approval of the Ministry of Railways. The proposed line will start from Nanchang, provincial capital of Kiangsi, pass Kaoan, Shangkao and Wantsai in western Kiangsi, and terminate at the Liling station of the Pingsiang-Chuchow Railway, in eastern Hunan. The cost of construction is estimated at $16,000,000.

COMMUNICATIONS

MUNICIPAL LOAN.—The Municipality of Harbin proposes to negotiate with a Japanese bank for a loan of $240,000 for the construction of a light railway through the industrial section of the city.

TELEGRAPHS IN CHINA.—For the purpose of readjusting and developing national telegraph enterprises, the Nanking Ministry of Communications is being authorized to float a $10,000,000 loan. The proceeds will be employed on readjustment and expansion of telegraph, telephone, and radio enterprises. The loan was to be issued on October 1 at 98, bearing interest at 6.5 per cent per annum, and secured on the surplus revenue of the Telegraph Administration.

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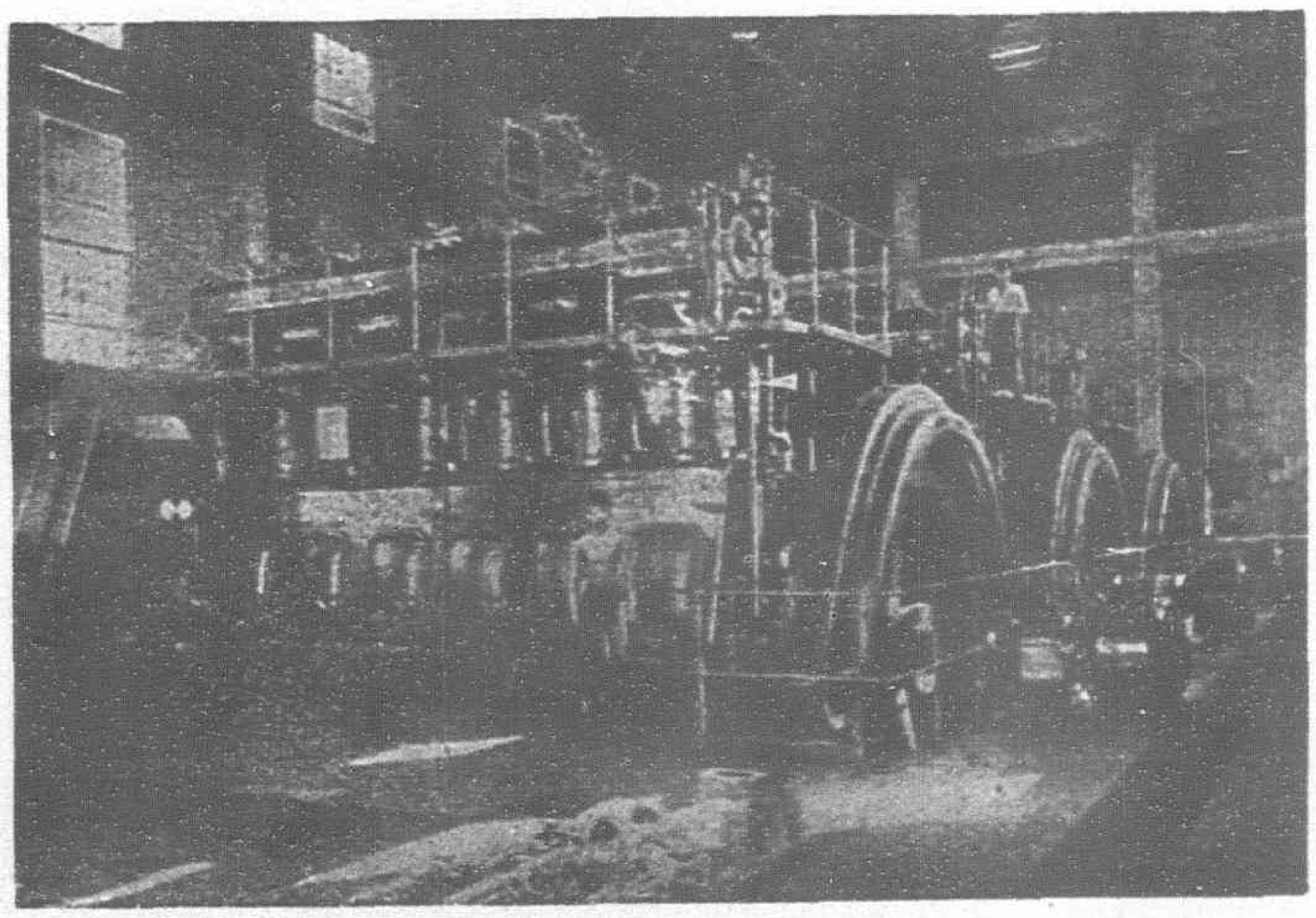

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TUNNEL DIFFICULTIES.—Construction of the Shimonoseki-Moji submarine tunnel is presenting, it is found, more difficult engineering problems than have ever been encountered in such work anywhere in the world. A committee of engineering experts which met at the Railway Ministry in Tokyo attributes the tricky nature of the ocean-bottom at this point as being responsible for the trouble.

WIRELESS IN CHINA.—Six additional wireless stations are to be erected in remote parts of Shensi. Apparatus has been bought and men are being sent out to erect and work the new stations. Radio telephone services between China and Japan, between China and Manila, and between China and England, will be inaugurated before long, the necessary apparatus having been installed in Shanghai.

TELEPHONE SCHEME.—Direct telegraphic communication between Tokyo and Changchun will be possible in two years, under the terms of an agreement concluded between the two Governments. The project, involving the expenditure of Y.20,000,000, will be undertaken jointly by the Japanese Ministry of Communications and the Manchuria Telephone and Telegraph Co., a Japanese-Manchurian concern.

TUMEN RIVER BRIDGES.—The two railway bridges over the Tumen River have been completed. The Chingsin bridge, measuring 500 meters, and the Shunchieh bridge, 230 meters long, are ready for traffic. Another bridge is being built across the Tumen by the Korean Government-General, while the National Road Construction Bureau of Manchoukuo is planning to erect six concrete bridges, and the Korean authorities are to erect five others.

TOKYO TO YOKOHAMA.—The Tokyo Cabinet has recognized the need for constructing another highway between Tokyo and Yokohama, a project which the Home Office has been advocating for some time. In anticipation of approval by the Finance Ministry of the initial appropriation of Y.2,500,000 in the next fiscal year, the Engineering Bureau is expected to complete preparations for construction in the near future. It is proposed to build the highway in five years at a cost of Y.15,000,000. It will run for about twelve miles from the Akabane Bridge, Shiba Ward, and the width will be about 75 feet.

TIENTSIN-TANGKU ROAD.—The rebuilding of the Tientsin-Tangku motor road, which work the authorities believe as having a significant bearing on the business conditions of Tientsin, is being undertaken by the Board of Public Works. A party of engineers who were recently sent out by the Board to survey the road has submitted their recommendations. The report is being studied, after which definite designs will be drawn up, costs estimated and construction work started forthwith. According to the report, the road extends 42 kilometers and its width ranges from six to twelve meters. It is one meter above the ground level and above high water level.

THE USAMI TUNNEL.—Usami tunnel opening near the Atami mouth of the famous Tanna tunnel, to carry a railway track farther down the Izu Peninsula to Ito, is taking much longer to bore than anticipated. Three faults, or dislocations caused by the slipping of rock masses have been discovered. At first, it was thought there was only one fault, but others were found 680 and 718 meters from the entrance. Thus the circuitous boring will have to be extended by 20 meters, or 110 meters in all. Boring was resumed after a thorough geological survey of the area had been made, sometime in February. Meanwhile, in the boring around the first fault, the flow of water in the tunnel increased. This reduced the heat to 85 degrees, but the dampness necessitates installation of special ventilation.

INDUSTRIAL

ELECTRIC LAMPS.—Electric lamps were exported from Japan to over 69 different countries last year. Both the U.S.A. and Great Britain were large buyers, while other purchasers included France, Belgium, India, Italy, the Argentine, Brazil and Australia.

WATER POWER STATION.—Application has been filed by the Kyushu Hydro-Electric Power Company with the Tokyo Communications Ministry for construction of a large water-power station capable of generating 50,000 kw. The dam to be built on the Mimi River in Miyazaki Prefecture will be 260 feet high. The station will be the largest power station in Kyushu.

ROAD CONSTRUCTION MACHINERY.—Quiet, but nevertheless important business is being done in China in road construction machinery and materials. In the Kwangsi Province, in particular, highway building has been making progress and all the main cities in this area are now linked up by sound roads, some of which are traversed by regular omnibus services.

SCRAP IRON FOR JAPAN.—As a result of the steadily increasing industrial activity in Japan, the market for scrap iron is particularly lively, and, in view of the African situation, is likely to continue so for sometime. The U.S.A., India and the United Kingdom are the largest suppliers in that order, but Great Britain's share has declined slightly in the last two years. There is now an excellent opportunity for a British revival, as the U.S.A. is demanding higher prices for its product and Japanese buyers are turning elsewhere.

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SEWAGE SCHEME.—The Municipality of Nanking is launching a $6,000,000 project to construct to much-needed drainage and sewage disposal system in the capital. This piece of construction, to be completed in three years, is under the direct supervision of Mr. H. S. Sung, director of the Public Works Department. Mr. F. J. M. Alma serves as chief engineer of the project.

CHINESE ASSEMBLY HALL.—The design by Boutcher & Co., Ipoh, architects, for a Chinese assembly hall has been accepted by the Perak Chinese Chamber of Commerce. The building is to cost $150,000 and will provide an assembly hall, a school and a stadium to accommodate 2,000 in addition to standing room for another 2,000. The assembly hall will hold 1,000 persons.

JAPANESE RUBBER BUSINESS.—Japan is now, according to the *Jiji Shimpo*, the second largest consumer of rubber in the world, topped only by the United States. At present crude rubber to a total of 450,000 metric tons is taken annually by Japan. Great Britain is a poor third. This outstanding demand for rubber is caused by the heavy shipments of Japanese rubber goods abroad.

WATER POWER STATION.—The first water power station of the Choshinko Hydro-Electric Company was recently completed in North Korea. The Choshinko company was founded in May, 1911. Work was started almost immediately on the great 108,000 kw. station, at a cost of Y.30,000,000, and it is said to be the largest in the Orient. Work on the second-period construction will start in the near future.

RAYON PULP PLANT.—Plans to manufacture rayon pulp from waste cotton are being entertained by the Mitsuma Bussan Kaisha, which is said to be considering foundation of a Y.10,000,000 company with a daily output of ten tons. Mitsui Bussan has contracted with the Dai Nippon Spinning Company to take over all its waste and to be negotiating on a similar basis with the Kanegafuchi Spinning Company.

TOYO NITROGEN EXPANSION.—The Toyo Nitrogen Industry Company has decided to manufacture benzol, setting up a plant at a cost of Y.1,000,000. For this purpose, the company will purchase the Kokusan Fertilizer Company and reincorporate it as the Japan Carbide Industry Company. The company will manufacture 15,000 metric tons of carbide a year in addition to benzol and also 4,000 metric tons of calcium cyanide.

CENTRAL BANK BUILDING.—Magnificent new premises have been constructed for the Central Bank of Manchuo in Harbin, within a stone's throw of the huge building of the Hongkong and Shanghai Bank. The building stands back from the road and has a flight of steps of great breadth, surmounted by large columns. Round the great hall are the different departments all fitted up in the most modern and approved style. The building is practically all steel and stone.

SULZER COMPRESSORS.—The Dai Nippon Jinzo Hiryo K.K., Toyama, has again extended its high-pressure gas compressor plant, which is already equipped with five Sulzer high pressure gas compressors, each for 300 atm. The machine recently supplied by Sulzer Brothers is also constructed for a working pressure of 300 atm., and when it is installed the total capacity of this Sulzer compressor plant will be increased by 700 cub.m. per hour to 10,000 cub.m. per hour in round figures. The company was one of the first to take up the manufacture of ammonia on a large scale in Japan.

FRENCH MUNICIPAL BUILDING.—First and second prizes in the competition for an architectural design for the proposed new French Municipal building in Shanghai have been awarded to the Shanghai firm of Leonard, Veysseyre and Kruze. The first prize was $16,000, and the second $8,000. The new building will be erected on the large site facing Avenue Joffre, destined to be a civic center for the Concession several years ago. It is considered the firm of Leonard, Veysseyre and Kruze will spend at least six months on working out details of design before contracts can be let. Under the general plans, there will be a square of tall structures faced by a park containing rows of fountains. The main entrance will be from Avenue Joffre.

MINING

NEW KOREAN COAL CO.—The Korean Anthracite Coal Company has been founded as the result of a merger. Its capital is Y.20,000,000.

BOOMING OF JAPANESE COPPER.—Japanese copper mining has been booming, due to the prosperity of the munitions industry. The gains of electric power have also been a strong factor. Demand for electric copper has been increasing abroad as well as in Japan. The Japan Mining Co., the heaviest copper producer, will have a very large profit.

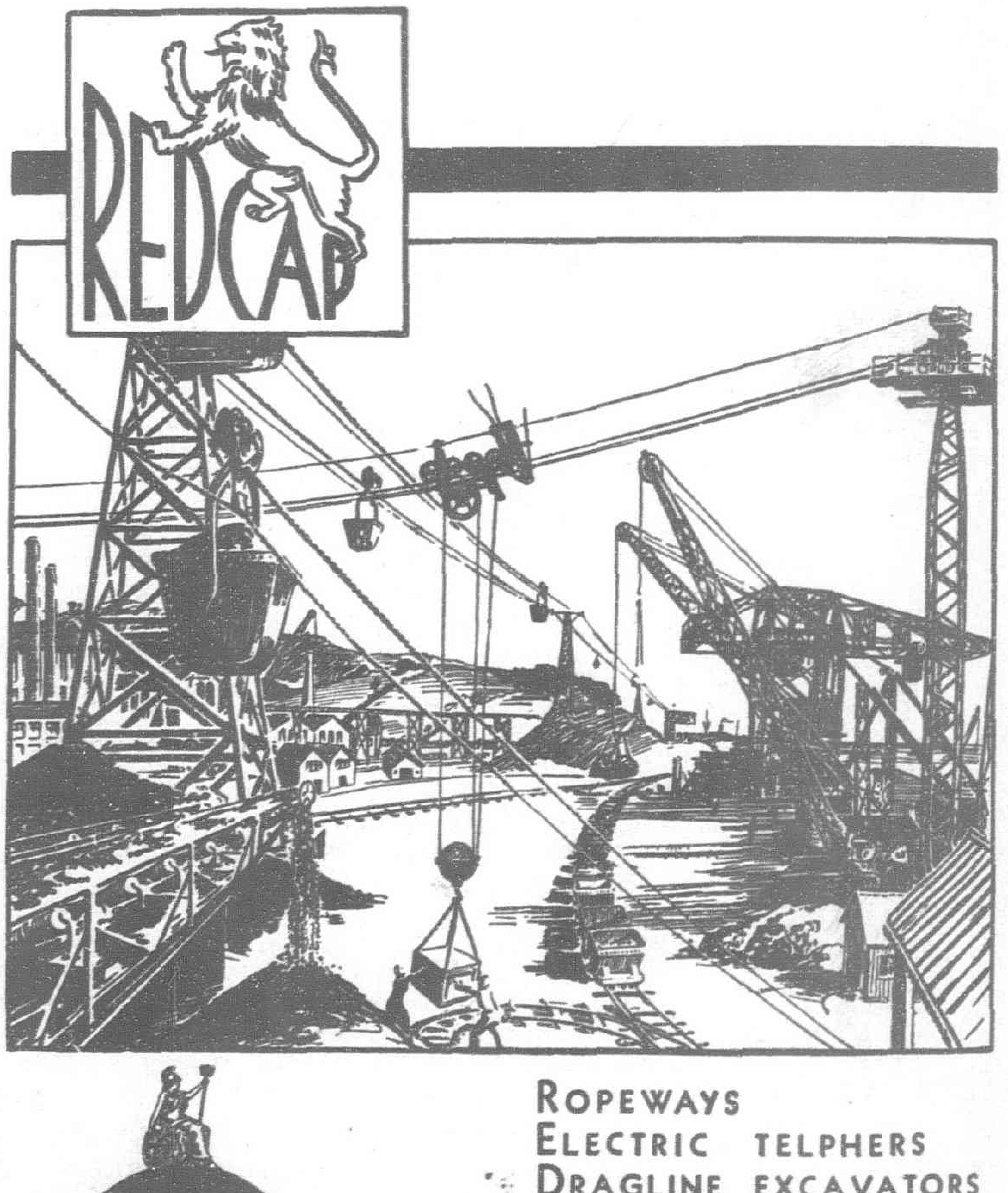
COAL MINES IN KWANGTUNG.—At the thirty-fifth meeting of the Board of Trustees for the Administration of the Indemnity Funds remitted by the British Government, the proposal of the Kwangtung Conservancy Commission for a loan of £80,000 in materials for the development of coal mines at Kuo Ya Tung was referred to the Technical and Finance Sub-Committees for further consideration.

GOLD IN BODAIBO.—Large gold bearing regions have been discovered between Bodaibo and the northern shore of Lake Baikal. A considerable number of streams were found to contain large amounts of gold.

IRON IN FUKIEN.—Rich deposits of iron ore have been discovered in Anki, southern Fukien. According to surveys made by engineering experts of the Provincial Department of Reconstruction, the amount of iron deposits is estimated at no less than forty million tons. The quality is stated to be better than that of the Hanyang mines in Hupeh or the Pingsiang mines in western Kiangsi. An analysis shows that the Fukien ore contains sixty per cent of iron.

FUEL OIL IN MANCHURIA.—Vice-Admiral Kotaro Mizutani, adviser to the South Manchuria Railway Company, recently arrived in Tokyo to arrange for expansion of the shale oil industry and the creation of a coal liquefaction industry. The South Manchuria Railway Company has succeeded, he says, in liquefying coal, as the result of experiments by the Navy which have been in progress for a long time. Business is to start this year. Production of shale oil is at the rate of about 100,000 tons a year at present and this will be doubled. Both enterprises are very important.

CHINA'S MINERAL RESOURCES.—China's vast mineral resources, as yet only probed by the most primitive methods, can best be discovered by modern geophysical methods, according to Dr. Erik T. Nystrom, Swedish expert adviser to the National Geological Survey. Dr. Nystrom said that China had been most badly prospected so far, and that the introduction of scientific methods, especially in the rich regions of southern Kiangsi, southern Honan, and northern Kwangtung, would undoubtedly reveal the presence of ores, especially sulphides, constituting primary requisites for the development of China's national economy.



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